SPECIAL ISSUE CONTAINING THE REPORTS OF THE BOSTON MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

SCIENCE

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SCIENCE

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

THE PERMANENT SECRETARY'S REPORT ON THE BOSTON MEETING

GENERAL FEATURES

THE seventy-sixth meeting of the American Association for the Advancement of Science and of the associated scientific societies came to an end in Cambridge, Massachusetts, on Saturday, December 30, having been opened on the evening of Tuesday, December 26. This was the annual meeting of the association year 1923, for the association year begins October 1. It is accounted the fourth Boston meeting, although the first meeting after the organization of the association was held in Cambridge. More correctly, the meeting just ended was the fifth Boston meeting.

As a great convention of American men and women of science, as an exposition of American scientific work and in every way the meeting was entirely successful. In attendance it almost equalled the Chicago meeting, held in December, 1920, which is recorded as having had the largest registration (2,413) in the history of the association. No past meeting has been the equal of the seventy-sixth with respect to the completeness with which the numerous fields of science were represented on the programs, and this is also true with respect to the arrangement of the meeting places and the convenience of the facilities for the numerous section and society sessions.

The total number of persons who registered at the Boston meeting is 2,339, and it is apparent that a large number were present who failed to register. The registration by regions is shown below:

The United States

Alabama	3	Dist. Columbia	125
Arizona	3	Florida	5
Arkansas	4	Georgia	8
California	18	Illinois	79
Colorado	6	Indiana	18
Connecticut	92	Iowa	18
Delaware	7	Kansas	8

Kentucky	6	New York	327
Louisiana	5	North Carolina	7
Maine	43	North Dakota	4
Maryland	41	Ohio	62
Massachusetts (Boston and Cambridge, 562)	838	Oklahoma	2
		Oregon	4
		Pennsylvania	116
Michigan	48	Rhode Island	62
Minnesota	27	Tennessee	8
Mississippi	3	Texas	8
Missouri	19	Vermont	22
Montana	4	Virginia	17
Nebraska	3	Washington	1
New Hampshire	49	West Virginia	13
New Jersey	60	Wisconsin	31
New Mexico	1		

Other Countries

Australia	1	Japan	2
Belgium	2	Norway	1
Brazil	3	Panama	1
Canada	75	Philippine Islands	5
Czecho-Slovakia	3	Porto Rico	1
China	11	Russia	1
England	1	Siam	1
Guatemala	1	Switzerland	1
Hawaii	3	South Africa	1
India	1		

All of the fifteen sections of the association were well represented in the programs, and thirty-two societies met with these. Of the societies meeting at Boston, twenty-seven are associated with the association, including twenty affiliated societies. Altogether, one hundred and forty-one scientific sessions were held, as well as a large number of business sessions, committee meetings, dinners, luncheons, smokers, etc. No field of scientific endeavor was wholly unrepresented in the great array of papers and addresses that were given.

This meeting was held on invitation of the Massachusetts Institute of Technology and Harvard University. Most of the sessions were held in the main buildings of the Massachusetts Institute, which are so arranged as to furnish very exceptional facilities for this kind of convention. Some of the sections and societies met at Harvard University, including about thirty of the one hundred and forty-one sessions. A few were held at the State House and a few at hotels. The registration room, the council room and the offices for mail, etc., were located in the Pratt Memorial Building on Massachusetts Avenue. With very few exceptions all session rooms were under the same roof with the registration room, and it was generally not necessary to go out of doors in order to pass from one meeting place to another. This feature was greatly appreciated, especially on Wednesday, Thursday and Friday, which were cold, with wind and snow. Excellent luncheons were very efficiently served in the Walker Memorial Building, a short distance from the main group of buildings. Altogether, the session rooms and other facilities were as nearly perfect as any that the association has ever enjoyed. A large and efficient corps of guides made it easy for those in attendance to find their way from place to place in the enormous but very simply arranged series of rooms and corridors. The fine hospitality of the Institute of Technology, Harvard University and of the Boston friends of science, which made the meeting such a pronounced success, was greatly appreciated.

The excellent preliminary arrangements were made by the local committee for the fourth Boston meeting, the members of which took up this important work last spring. During the last two months before the meeting the committee and its subcommittees were necessarily very busy indeed. A considerable fund was raised by subscription to cover the extra expense of the meeting. The association members and the friends of science in Boston responded very generously, and the association wishes to express here its appreciative thanks to these supporters, one and all.

To the staff of the Massachusetts Institute of Technology the hearty thanks of the association are due for the free use of their offices and classrooms and for the fine and inspiring exhibition of the institute laboratories on Wednesday afternoon. The association is greatly indebted to Harvard University, also, for the use of some of its rooms, and especially for the very pleasant and profitable Harvard Day, Thursday, with its very enjoyable luncheon.

The local committee consisted of the following members: S. C. Prescott, *chairman*, A. L. Townsend, *secretary*, Everett Morss, *treasurer*, H. S. Ford, *assistant treasurer*, Frederick L. Allen, G. C. Anthony, I. W. Bailey, Geo. H. Barton, R. P. Bigelow, Miss A. F. Blood, Mrs. E. P. Cunningham, L. J. Henderson, A. F Holmes, Alexander Inglis, E. S. King, A. B. Lamb, Waldemar Lindgren, H. E. Lobdell, Theodore Lyman, Mrs. R. C. Maclaurin, H. V. Neale, J. F. Norris, C. L. Norton, W. J. V. Osterhout, G. H. Parker, Nathan van Patten, H. Shapley, H. W. Tyler, W. M. Wheeler,

E. C. Wilm. The subcommittees were as follows: *Hospitality,* C. L. Norton; *Entertainment,* J. F. Norris and A. B. Lamb; *Hotel and Dinners,* A. L. Townsend; *Transportation,* H. S. Ford; *Meeting Places,* S. C. Prescott and A. L. Townsend; *Exhibits,* R. P. Bigelow; *General Program,* S. C. Prescott; *Publicity,* F. L. Allen and H. E. Lobdell; *Membership,* G. H. Barton; *Registration,* A. F. Holmes. Each section of the association and each society that met with the association at Boston was locally represented by one or more persons who cared for its special needs, in consultation with the local committee and the sub-committees. To all of these local representatives, as well as to the local committee and the subcommittees, the cordial thanks of the association and of the associated societies are here expressed. It is a pleasure to record here specially the very efficient work of Professor Prescott, Mr. Townsend and Mr. Allen, whose untiring services to the association continued throughout the meeting. A report of the local committee will be made to the permanent secretary for the use of future local committees.

The general secretary and the permanent secretary visited Boston at the end of November to help the local committee in the final stages of the general preparations, and the preliminary announcement of the meeting was published shortly after the permanent secretary's return. It was sent to all whose names were at that time on the roll of the association. The announcement is larger than any earlier association publication of this kind, containing seventy-eight pages, and many members expressed their gratification as to its form and completeness. A new feature, introduced for the first time in this announcement, is a twelve-page preliminary account of the session programs, as far as information about these was available at the time. It is planned for the future that the features about which members wish to be informed early will be published separately from the rest of the announcement and much earlier than it is possible to issue the program notes. They will probably appear in the columns of SCIENCE about November 1.

The general program of the fourth Boston meeting, an attractive book of 158 pages in a gray paper wrapper with red lettering, was ready for distribution before noon on Tuesday, December 26. In excellence of style and typographical work, as well as in size, it surpasses all earlier programs published by the association. The usefulness of the program was greatly enhanced by a summary of events, arranged by session periods, inserted just before the program pages. This valuable feature of the program enabled each person to determine at a glance which of the many simultaneous sessions he might wish to attend.

To the section and society secretaries and other section and society officers we owe the programs themselves, and it is fitting that appreciative acknowledgment be here made of their tireless and continued work in arranging the programs, a work that needs to be accomplished mainly in a very short time just before the meeting and frequently involves considerable difficulties.

That the general program is serving a useful purpose is shown by the fact that an increasingly large number of those in attendance are coming to rely on it almost exclusively. It may be regretted that the publication of so many separate society programs is necessary for these meetings, and it might be worth while to consider whether arrangements can not be made by which the societies would depend wholly upon the general program and reprints thereof, which might be furnished to the societies at a very low cost. No small saving might thus be accomplished.

The most serious difficulty involved in the preparation of the general program was, as usual, due to the fact that many of the associated societies are obliged to leave their programs open until very late, so that manuscripts for these were in many cases not received until a few days before the printing of the program. All of the printing was done in the last week before the opening of the meeting. The work of editing was largely performed by the assistant secretary, who was in Boston during the entire week just before the meeting, attending to this work.

Copies of the Boston program will be sent to members who remit five cents for postage to the permanent secretary's Washington office.

The official badge for the meeting was a small celluloid button, about two centimeters in diameter, a red-bordered, silver circle, with

the legend "A. A. A. S., Boston, 1922."

Besides the badge, the general program and an additional copy of the preliminary announcement, each person registering at the Boston meeting received, with the compliments of Ginn and Company, a copy of Edwin M. Bacon's "Boston, a guide book to the city and vicinity," an attractive book of about one hundred and fifty pages, bound in red cloth with gilt lettering and containing numerous illustrations and maps as well as interesting accounts of historic landmarks, etc. For the thoughtful courtesy of the donors of this little book were expressed the sincere thanks of the association, of the associated societies and especially of all persons who attended the meeting. It added much to the pleasures and profits of the meeting period.

Exhibition of Scientific Apparatus and Products

A very satisfactory exhibition of scientific apparatus and materials was held throughout the meeting, in the large drafting room on the fourth floor of the main building of the institute. This was in charge of Professor R. P. Bigelow, whose efficient services in this connection were very greatly appreciated by all in attendance. A number of well-known firms and institutions took part in the exhibition, and excellent opportunity was afforded to view materials and specimens of various kinds and to observe apparatus in operation. The exhibition included clear and opaque fused-quartz, optical glass, insulators, instruments for long-range transmission of light, microscopes, projection apparatus, telescopes, electric ovens and other electric appliances, geological models and relief maps, chemical apparatus and biological specimens and models.

Exhibits pertaining to the sessions of a number of the sections and societies were to be found in rooms near the corresponding meeting places. In connection with the meeting of Section L an exhibit was shown that included books, photographs, engravings and other objects of interest in relation to the history of science, especially a collection of historical books on physics. The American Society of Zoologists exhibited microscopic preparations, living and preserved zoological specimens, manuscripts and drawings. The American Association of Economic Entomologists had an extensive exhibit pertaining to insect pests and their control. The Botanical Society of America, the American Phytopathological Society, the Sullivant Moss Society and the Ecological Society of America displayed interesting collections of books, microscopical and other preparations, drawings and charts, and living as well as preserved biological specimens.

A special exhibition of the institute laboratories in operation was held on Wednesday afternoon. The visiting members of the association were afforded an excellent opportunity to inspect the entire group of magnificent buildings and laboratories belonging to the institute. Guides directed visitors to the various places of interest, and members of the faculty and staff were in attendance to explain special features.

Social and Entertainment Features of the Meeting

Among the many social and entertainment features of the meeting should be mentioned the following:

A general reception in Walker Memorial Building following the opening exercises on Tuesday evening.

Tea was served by the Boston women in the Emma Rogers Room of the Massachusetts Institute of Technology on the afternoons of Wednesday, Thursday and Friday.

The American Academy of Arts and Sciences of Boston held open house, throughout the meeting, for members of the association and their friends. Tea was served each afternoon.

The College Club of Boston extended the privileges of its drawing rooms and restaurants to visiting women and their friends, throughout the meeting.

The library and reading room of the Affiliated Technical Societies of Boston was open to visitors for the meeting.

On Wednesday afternoon the Museum of Fine Arts was open to those attending the meeting, and efficient guides conducted visitors through the Museum. Tea was served by the women connected with the Museum.

The laboratories of the Massachusetts Institute of Technology were open to the inspection of visitors on Wednesday afternoon, and members of the staff were present to explain the many interesting and instructive features.

Thursday, December 28, was Harvard Day. Visiting members and their friends were guests of the university, and courteous guides conducted parties to points of interest. A complimentary luncheon was served in Memorial Hall.

On Thursday evening there was an exhibition of educational motion pictures, the films being furnished by the Society for Visual Education, of Chicago; and Dr. F. R. Moulton, professor of astronomy in the University of Chicago and secretary of the society, spoke with reference to the pictures that were shown.

Women interested in scientific work had a luncheon on Friday at River Bank Court, and Miss Anne S. Young, of the astronomical department of Mount Holyoke College, spoke in an interesting and inspiring way on the part to be played by women in science.

The board of trustees and the librarian of the public library of the city of Boston were the hosts of association members and their friends on Friday afternoon. Docents conducted groups of guests through the central building on Copley Square, and tea was served in the staff room.

The Northeastern Section of the American Chemical Society tendered a complimentary smoker to members of Section C (Chemistry) on Friday evening.

By special invitation a number of those attending the meeting visited the Massachusetts Agricultural College at Amherst on Friday and Saturday.

The buildings of Wellesley College, at Wellesley, Massachusetts, were open, by special invitation, to visitors on Saturday afternoon, and tea was served informally in the Shakespeare House.

A number of those in attendance at the meeting, especially those of Section K (Social and Economic Sciences), visited Wellesley Hills on Saturday on special invitation of the Babson Institute and the Babson Statistical Organization. Motor cars were provided for a visit to the new campus and buildings of the Babson Institute and a complimentary luncheon was provided at the Club House.

Dinners and Banquets

Every evening of the meeting was characterized by one or more dinners held by the various groups of men and women of science who were in attendance. On Wednesday occurred the Ladies' Dinner of the American Mathematical Society. On the same evening were held the Ecological Society dinner and the annual dinner of the Society of Sigma Xi.

On Thursday were held dinners for the following groups: the mathematicians, the zoologists (with the address of the retiring president of the American Society of Zoologists and the retiring vice-president for Section F, American Association for the Advancement of Science, Dr. C. A. Kofoid), the botanists (with the address of the retiring president of the Botanical Society of America, Dr. C. E. Allen), the anthropologists, the psychologists (with the address of the retiring president of the American Psychological Association, Dr. Knight Dunlap), and the agronomists. The American Nature-study Society held a dinner on Thursday in honor of Mrs. Anna B. Comstock, who has long been professor of nature-study in Cornell University. The banquet of the New England Forestry Congress was also held Thursday evening, and visiting students of forestry were invited.

The following groups held dinners on Friday: the physicists, the entomologists, the phytopathologists, the naturalists (with the address of the retiring president of the American Society of Naturalists, Dr. W. M. Wheeler), and the Gamma Alpha Graduate Scientific Fraternity.

The dinner of the Metric Association occurred on Saturday evening, followed by an informal session of the association, at which a number of speakers addressed those in attendance.

Publicity Arrangements at Boston

The public arrangements at the fourth Boston meeting were very excellent indeed, much more efficient than those at any earlier meeting of the association. The publicity office in the Pratt Memorial Building was in charge of Mr. Frederick L. Allen, secretary to the Corporation of Harvard University, who acted as chairman of the subcommittee on publicity, American Association for the Advancement of Science. He organized an efficient corps of workers, who prepared mimeograph copy on the various papers and addresses, having resulting sheets promptly ready for the representatives of the daily press. The result was a very satisfactory example of this kind of publicity work, which by its very nature is exceedingly difficult. The newspapers of Boston and many other large centers as well gave much space to the association throughout the week. Especially did the

Boston *Transcript* give a fine service to science and education and to the association.

Mr. Allen and his subcommittee on publicity received much help from Science Service, which again cooperated in a very fine spirit with the association in its endeavors to spread the scientific news of the meeting and to arouse public interest in the work of our organization. Science Service is an institution established in Washington under the control of the American Association for the Advancement of Science, the National Academy of Sciences and the National Research Council. Its sole purpose is to disseminate scientific information through the newspapers. Its editor, Dr. Edwin E. Slosson, was present throughout the meeting, taking part in the work of the publicity office. The valuable help received on this occasion from Dr. Slosson and from Mr. Watson Davis, also of Science Service, is greatly appreciated by the association.

A letter requesting advanced abstracts of papers to be given at the approaching sessions was sent out by Science Service to every person whose name appeared in the session programs, just as soon as the manuscripts for these programs were received by the permanent secretary's office. On the arrival of each program manuscript, copies of this letter were sent to all whose names appeared in the program, and most of the letters were sent out in ample time for replies to be received in Washington by Science Service a week or more before the opening of the meeting. As the abstracts came in, copies were promptly forwarded, in daily batches, to Mr. Allen at Cambridge, and his publicity office thus came into possession of a large amount of advance material to work upon, which was used to great advantage. Altogether, nearly 250 abstracts were received, during the period from December 7 to the time of the meeting. The permanent secretary wishes here to express the thanks of the association officers and Science Service to the members who responded promptly to the "blue sheet" request for advance abstracts. To the pains thus taken at a crowded and busy time by so many of those who were to speak at the meeting is largely due the pronounced success attained by our publicity office at Boston.

Besides the great service performed by Mr. Allen and his staff, mainly through the local press, Science Service prepared and sent out under release date 59 advance accounts covering the meeting. These were in the *Daily Science News Bulletin* regularly sent out by the Service to nearly 50 daily newspapers and magazines, reaching perhaps between two and three millions of readers throughout the United States. In addition to this advance mail service in the *Daily News Bulletin*, Science Service telegraphed a 500 word account of the meeting to each of 14 large dailies for each morning and evening of the first four days of the meeting. In all Science Service disseminated not less than 100 different accounts based on the Boston meeting.

The association and the associated societies may well congratulate themselves on the growing success of their publicity work during recent years, and especially on the unprecedented success of this work at Boston. This aspect of our work has an importance to men and women of science and to the public as a whole that must be regarded as equal to that of any of the other lines of endeavor in which our organization is engaged. It is planned to attempt still further improvement in our publicity work at future annual meetings.

The General Sessions

The seventy-sixth meeting was formally opened on the evening of Tuesday, December 26, in the main hall of Walker Memorial Building. Addresses of welcome were made by Dean H. P. Talbot, of the Massachusetts Institute of Technology; by Dr. T. W. Richards, representing President Lowell of Harvard University; by the mayor of Boston, Mr. James M. Curley, and by the mayor of Cambridge, Mr. Edward W. Quinn. These speakers were introduced by Professor S. C. Prescott, chairman of the local committee for the fourth Boston meeting. Following the addresses of welcome, Dr. J. Playfair McMurrich, president of the association, took the chair. He introduced the retiring president, Dr. Eliakim H. Moore, who delivered his address on "What is a number system?" By way of introduction Dr. Moore emphasized the great progress made by American science during the last 74 years and by the association, which was organized as a result of the Cambridge

meeting of the American Association of Geologists and Naturalists, held in September, 1847. Then, addressing himself as a representative of pure mathematics to the devotees of the natural sciences, Dr. Moore raised the question of the distinction between mathematics and the natural sciences. He pointed out that, although mathematics is simpler and more self-contained than are the other sciences, it is not absolutely self-contained; in its development it constantly receives stimuli from non-mathematical sources. Though mathematics has impressed itself profoundly on other sciences by its ideal of mathematical rigor, and though it is perhaps the typical science, the fundamental science, yet it should not be separated from the natural sciences on the ground of method, as expressed in the view commonly held that mathematics is deductive and the natural sciences are primarily inductive. To show how this view is contradicted by the history of mathematics, the speaker, in response to the question "What is a number system?" undertook to give an impressionistic descriptive view of the historical development of the fundamental notion of number. It was emphasized that the separation of mathematics from the natural sciences should be considered as based on subject matter, not on method. Every branch of science, mathematics included, has its continually interplaying inductive and deductive phases. Mathematics, as simpler, more self-contained and earlier developed, hopes to be of value to all sister sciences, not only by means of specific results, but also by the development of general methods capable of application in many fields of knowledge.

The opening exercises were followed by a general reception given by the Corporation of the Institute of Technology to the president and retiring president of the association. There was a large attendance, and the occasion was a very enjoyable and profitable one. Refreshments were served in the galleries of the main hall.

A joint session of the association and the Society of Sigma Xi formed the second general session, held on Wednesday evening, December 27. The address on this occasion was on "The nation and its health" by Dr. Livingston Farrand, president of Cornell University. Dr. Farrand reviewed the progress of public health work in this country and pointed out that since 1870 the average length of life has been increased by fifteen years, that marked reduction has occurred during this period in infant mortality and in mortality due to tuberculosis, typhoid, smallpox and many other diseases. The efforts of health workers and organizations have, however, been unable thus far to prevent increases in certain unconquered diseases, such as cancer and diseases of the heart and kidneys. The most outstanding problem at present concerns the control of the degenerative diseases of later life, an increase in mortality from these being an inevitable consequence of improvements in the control of diseases of infancy and youth. Dr. Farrand outlined the organized movements in this country for the further improvement of public health and urged that scientific men support these movements in every feasible way.

At the third general session, held on Thursday evening, an illustrated public lecture on "Lessons from the Grand Canyon" was given by Dr. William Morris Davis, emeritus professor of geology in Harvard University. Professor Davis emphasized the prediction that the widening of the Colorado Canyon by erosion will not stop until all the neighboring highlands shall have been laid low and the whole region tributary to the river shall have been reduced to a nearly featureless plain, sloping very gently toward the river mouth. Furthermore, the rock structures forming the wall of the canyon are outspoken witnesses to the occurrence of five long antecedent cycles of erosion before the present cycle began. Professor Davis pointed out, moreover, that the long periods of past time recorded by these alterations of vast erosions and depositions were themselves preceded by a still longer period during which the complex rocks, seen in the basal portion of the gorge, were formed. The lecture was accompanied by a series of wonderfully perfect lantern slides that brought out very clearly many of the features that were discussed.

On Friday afternoon occurred the first Sedgwick Memorial Lecture under the auspices of the department of biology and public health of the Massachusetts Institute of Technology. The Sedgwick lectureship has been established to commemorate the services of the late Pro-

fessor Sedgwick to the cause of biology and public health. These lectures are to be given from year to year by men of distinguished eminence in the several subjects comprehended within the general scope of biology and public health, in order that there may be fittingly expressed the deep and broad sympathy that characterized the man whom the lectureship is designed to honor.

The lecture this year was delivered by Dr. Edmund B. Wilson, Da Costa professor of zoology in Columbia University, who spoke on "The physical basis of life." In this address illustrated by lantern slides, Dr. Wilson reviewed some of the problems of protoplasm and the cell from the standpoint of the modern cytologist, embryologist and geneticist, comparing present views with those expressed by Huxley in his Edinburgh address fifty years ago. The speaker showed how the problems of the cytologist merge into those of the colloid chemist and the biochemist, and how from either point of view the cell appears as a complex, definitely organized system. The cytologist and the biochemist alike are driven to the assumption of a definite organization in the apparently structureless ground substance or hyaloplasm that forms the fundamental basis of the cell system. Reasons were given for the conclusion that this substance consists of innumerable ultra-microscopic dispersed bodies of all orders of magnitude—many of them self-perpetuating, and forming the foci for visible formed elements of the cell system. Many facts point to the conclusion that both the visible and the invisible components of the system are segregated and distributed by definitely ordered processes in cell-division and heredity. Life is a property of the system as such, and the problem of its physical basis is inseparable from the problem of the organization of the system; but we still have no more than a rudimentary understanding of what this organization is. There is, however, no reason to despair of solving this problem by mechanistic methods—by observation and experiment; vitalistic conceptions lead us merely to abandon hope of progress.

The fifth, and last, general session was held on Friday evening, December 29, this being a special session of Section M (Engineering). The speaker on this occasion was Mr. Calvin W. Rice, secretary of the American Society of Mechanical Engineers, who delivered a very interesting and stimulating illustrated lecture on "Engineering and scientific developments in South America." Mr. Rice dealt mainly with his experiences in South American countries during a recent trip in which he attended the International Engineering Congress as the official delegate of many engineering societies of the United States and Canada. It was pointed out that South American civilization is in many respects very excellent indeed, and is not nearly always to be regarded as inferior to our own. Displaying some South American newspapers with first pages altogether devoted to world news rather than to the crime stories that are so conspicuous in our daily press, he urged that English-speaking Americans should follow South American example and take greater interest in world affairs. Turning to the status of engineering in South America, Mr. Rice emphasized the point that engineers are there generally regarded as representing the highest type of citizen. South American engineers are now well organized, owing mainly to the activities of Mr. Rice. Every South American country now has its engineering organization, and these organizations are interrelated so as to constitute a world fraternity giving service to all who are engaged in the engineering profession. They cooperate with engineering societies in the northern division of the continent.

THE COUNCIL ROLL AT BOSTON

The affairs of the association are wholly in the charge of the council, which consists of the president, the vice-presidents, the treasurer, the secretaries, the council representatives of the affiliated societies and academies and eight members elected by the council itself. The list of council members for the seventy-sixth meeting is shown below, arranged according to this classification. The attendance at the four Boston sessions is shown by the numerals that precede members' names, the four numerals corresponding to the four sessions, on Tuesday, Wednesday, Thursday and Friday, respectively. Thus, the numbers 2, 4 before a name indicate that the member so marked was present at the Wednesday and Friday sessions of the council.

Every council member receives an official

notice, calling his attention to his responsibility, just before each annual meeting, with the urgent request that he attend the council sessions and take part in the direction of the affairs of the association. It is greatly to be deplored that not more of the members seem to realize the importance of their responsibilities to the cause for which our association stands, that not more of them make it a point to attend the council sessions. A very small number of the absentees this year presented reasons for their absence, or arranged for representatives to take their places. It is very gratifying, however, to note that, out of the 126 members of the council, there were but 64 that did not appear at all at the Boston sessions. On Tuesday 29 were present; on Wednesday, 32; on Thursday, 22; on Friday, 37. It is noteworthy that the secretaries, who receive from the association a mileage allowance for their trips to the annual meetings, show attendance records above the average. There are seventeen of these, and five of them attended all of the Boston sessions. Many of the representatives of the affiliated societies and academies this year failed to be present at any of the council sessions. Perhaps it needs to be emphasized that these representatives bear important responsibilities to their societies and to the association as a whole. The council holds sessions only at the annual meetings of the association, and the democratic nature of our organization renders it very important indeed that attendance at these sessions should be as complete as possible.

MEMBERS OF THE COUNCIL FOR THE FOURTH BOSTON MEETING

(Ex-Officio Members)

The President:

1, 2, 4 J. Playfair McMurrich, University of Toronto.

The Vice-Presidents for the Sections:

4 G. A. Miller (A), University of Illinois.

1, 2, 4 F. A. Saunders (B), Harvard University.

W. Lash Miller (C), University of Toronto.

Otto Klotz (D), Ottawa, Canada.

1 H. W. Shimer (E), Massachusetts Institute of Technology.

1 M. M. Metcalf (F), Oberlin College.

1, 2, 4 F. E. Lloyd (G), McGill University.

3, 4 T. Wingate Todd (H), Western Reserve University.

4 Raymond Dodge (I), Wesleyan University.

2 Henry S. Graves (K), Yale University.

Wm. A. Locy (L), Northwestern University.

F. M. Feiker (M), New York City.

Francis W. Peabody (N), Boston City Hospital.

R. W. Thatcher (O), New York Agricultural Experiment Station.

Bird T. Baldwin (Q), University of Iowa.

The Permanent Secretary:

1, 2, 3, 4 Burton E. Livingston, Johns Hopkins University.

The General Secretary:

1, 2, 3, 4 D. T. MacDougal, Desert Laboratory.

The Treasurer:

R. S. Woodward, Carnegie Institution of Washington.

The Secretaries of the Sections:

1, 2, 3, 4 Wm. H. Roever (A), Washington University.

1, 4 Otto Koppius (B; acting for S. R. Williams), Oberlin College.

1,3, 4 W. D. Harkins (C), University of Chicago.

3 F. R. Moulton (D), University of Chicago.

1, 2, 3, 4 Elwood S. Moore (E), University of Toronto.

4 H. W. Rand (F), Harvard University.

1, 2, 3, 4 Robert B. Wylie (G), University of Iowa.

1, 3 E. A. Hooton (H), Peabody Museum, Cambridge, Mass.

2, 4 Frank N. Freeman (I), University of Chicago.

1 Frederick L. Hoffman (K), Babson Institute.

2, 4 Frederick E. Brasch (L), Rogers Park, Chicago.

L. W. Wallace (M), Washington, D. C.

1, 4 A. J. Goldfarb (N), College of the City of New York.

3, 4 P. E. Brown (O), Iowa State College.

1 A. S. Barr (Q), Detroit, Mich.

MEMBERS REPRESENTING AFFILIATED SOCIETIES

The Representatives of the American Mathematical Society:

1 O. D. Kellogg, Harvard University.

1 R. G. D. Richardson, Brown University.

The Representatives of the Mathematical Association of America:

2, 3 W. D. Cairns, Oberlin College.

2 H. L. Rietz, University of Iowa.

The Representatives of the American Physical Society:

Theodore Lyman, Harvard University.

Dayton C. Miller, Case School of Applied Science.

The Representative of the American Meteorological Society:

1, 2, 3, 4 W. J. Humphreys, U. S. Weather Bureau.

The Representative of the Optical Society of America:

1 F. K. Richtmyer, Cornell University.

The Representatives of the American Chemical Society:

Charles L. Parsons, Washington, D. C.

Edgar F. Smith, University of Pennsylvania.

The Representatives of the American Astronomical Society:

1 Louis Bell, West Newton, Mass.

1, 2, 4 John C. Duncan, Whitin Observatory.

The Representatives of the Geological Society of America:

E. O. Hovey, American Museum of Natural History.

Charles Schuchert, Yale University.

The Representatives of the Association of American Geographers:

Richard E. Dodge, Connecticut Agricultural College.

1 Robert DeC. Ward, Harvard University.

The Representatives of the Seismological Society of America:

H. F. Reid, Johns Hopkins University.

1, 2 S. D. Townley, Stanford University.

The Representative of the American Geographical Society of New York:

Isaiah Bowman, New York City.

The Representatives of the American Society of Zoologists:

H. E. Crampton, Columbia University.

Charles Zeleny, University of Illinois.

The Representatives of the Entomological Society of America:

Arthur Gibson, Ottawa, Canada.

2, 4 C. L. Metcalf, University of Illinois.

The Representatives of the American Association of Economic Entomologists:

2, 4 T. J. Headlee, New Jersey Agricultural Experiment Station.

1, 2, 3, 4 L. O. Howard, U. S. Department of Agriculture.

The Representative of the Eugenics Research Association:

Harry H. Laughlin, Cold Spring Harbor, N. Y.

The Representative of the American Society of Mammalogists:

2, 4 Hartley H. T. Jackson, U. S. Biological Survey.

The Representatives of the Botanical Society of America:

C. E. Allen, University of Wisconsin.

J. R. Schramm, National Research Council.

The Representatives of the American Phytopathological Society:

4 Mel. T. Cook, New Jersey Agricultural Experiment Station.

C. L. Shear, U. S. Department of Agriculture.

The Representatives of the American Society of Naturalists:

2, 3 John H. Gerould, Dartmouth College.

J. Arthur Harris, Cold Spring Harbor, N. Y.

The Representatives of the Ecological Society of America:

Stephen A. Forbes, University of Illinois.

Edgar N. Transeau, Ohio State University.

The Representatives of the American Genetic Association:

A. F. Blakeslee, Cold Spring Harbor, N. Y.

4. E. N. Wentworth, Armour's Bureau of Agriculture, Research and Economics.

The Representative of the American Microscopical Society:

Paul S. Welch, University of Michigan.

The Representatives of the American Anthropological Association:

J. Walter Fewkes, Smithsonian Institution.

2, 3, 4 Clark Wissler, American Museum of Natural History.

The Representatives of the American Psychological Association:

Edwin G. Boring, Harvard University.

Edward A. Bott, University of Toronto.

The Representatives of the American Society of Mechanical Engineers:

Ira N. Hollis, Worcester Polytechnic Institute.

Dugald C. Jackson, Massachusetts Institute of Technology.

The Representatives of the American Institute of Electrical Engineers:

2, 4 A. E. Kennelly, Harvard University.

4 John B. Taylor, Schenectady, N. Y.

The Representatives of the American Institute of Mining and Metallurgical Engineers:

Waldemar Lindgren, Massachusetts Institute of Technology.

1, 2, 3, 4 J. B. Tyrrell, Toronto, Canada.

The Representatives of the American Society of Civil Engineers:

John R. Freeman, Providence, R. I.

George C. Whipple, Harvard University.

The Representatives of the Illuminating Engineering Society:

Ernest Fox Nichols, Nela Research Laboratory.

Clayton H. Sharp, White Plains, N. Y.

The Representative of the American Society for Testing Materials:

C. L. Warwick, Philadelphia, Pa.

The Representatives of the American Medical Association:

Geo. H. Simmons, Chicago, Ill.

Geo. M. Kober, Washington, D. C.

The Representative of the American Association of Anatomists:

Simon H. Gage, Cornell University.

The Representative of the Society of American Bacteriologists:

E. O. Jordan, University of Chicago.

The Representative of the American Society of Agronomy:

3, 4 W. L. Slate (representing C. A. Mooers, University of Tennessee).

The Representative of the Society of American Foresters:

Gifford Pinchot, Milford, Pa.

The Representative of the American Society for Horticultural Science:
1, 2, 4 J. K. Shaw, Massachusetts Agricultural Experiment Station.

The Representative of the Canadian Society of Technical Agriculturists:
W. H. Brittain, Truro, N. S., Canada.

The Representatives of the National Society of College Teachers of Education:
Arthur J. Jones, University of Pennsylvania.
John W. Withers, New York University.

The Representatives of the National Society for the Study of Education:
Ernest Horn, University of Iowa.
1 Guy M. Whipple, University of Michigan.

The Representative of the American Federation of Teachers of the Mathematical and Natural Sciences:
William A. Hedrick, Washington, D. C.

The Representative of the Southern Education Society:
J. P. McConnell, East Radford, Va.

The Representatives of the Society of Sigma Xi:
2 C. E. McClung, University of Pennsylvania.
1, 2 Edward Ellery, Union College.

The Representative of the American Association of University Professors:
J. M. Coulter, University of Chicago.

The Representatives of the Gamma Alpha Graduate Scientific Fraternity:
L. I. Knight, University of Minnesota.
2 H. L. Rietz, University of Iowa.

The Representative of the Illinois State Academy of Science:
Charles T. Knipp, University of Illinois.

The Representative of the Iowa Academy of Science:
2 Geo. W. Stewart, University of Iowa.

The Representative of the Kansas Academy of Science:
O. P. Dellinger, Pittsburgh, Kans.

The Representative of the Kentucky Academy of Science:
A. M. Peter, Kentucky Experiment Station.

The Representative of the Maryland Academy of Sciences:
Arthur B. Bibbins, Baltimore, Md.

The Representative of the Michigan Academy of Science, Arts and Letters:
E. C. Case, University of Michigan.

The Representative of the Nebraska Academy of Sciences:
J. C. Jensen, Wesleyan University.

The Representative of the New Orleans Academy of Science:
H. W. Moseley, Tulane University.

The Representative of the North Carolina Academy of Science:
4 Z. P. Metcalf, North Carolina College of Agriculture and Engineering.

The Representative of the Ohio Academy of Science:
2, 3, 4 E. L. Rice, Ohio Wesleyan University.

The Representative of the Oklahoma Academy of Science:
L. B. Nice, University of Oklahoma.

The Representative of the Wisconsin Academy of Sciences, Arts and Letters:
3 E. M. Gilbert (representing Chancey Juday, University of Wisconsin).

ELECTED MEMBERS OF THE COUNCIL

1, 2, 3, 4 J. McKeen Cattell, Garrison-on-Hudson, N. Y.
4 F. G. Cottrell, American University.
H. C. Cowles, University of Chicago.
2, 4 A. E. Douglass, University of Arizona.
4 John C. Merriam, Carnegie Institution of Washington.
4 G. A. Miller, University of Illinois.
W. E. Ritter, Scripps Institution.
1, 2, 3, 4 Henry B. Ward, University of Illinois.

PROCEEDINGS OF THE COUNCIL AND EXECUTIVE COMMITTEE AT BOSTON

The executive committee of the council met in the grill room of the Hotel Somerset at 10 a. m., on Tuesday, December 26, and the council met at 2 p. m. on the same day in the council room, Pratt Memorial Building, Massachusetts Institute of Technology. Later sessions of the council occurred in the same place at 9 o'clock on Wednesday, Thursday and Friday, and each of these later council sessions was followed by a session of the executive committee. Following is a summary of the business transacted:

(1) It was reported to the executive committee that the committee had authorized, by a mail ballot, a contribution of $100 to the American Institute of Sacred Literature, to aid in the dissemination by the institute of literature on the status of the theory of evolution. It was also reported that this contribution had been duly made.

(2) The executive committee voted that if any one of its members shall have been absent for two consecutive meetings, such action shall be regarded as a resignation and shall come before the committee for action. This was a reaffirmation of a similar rule that was in force in the old committee on policy, before the adoption of the present constitution.

(3) The treasurer's audited financial report for the period from December 20, 1921, to September 30, 1922—thus bringing the treasurer's year into conformity with the association year—was accepted by the council and ordered printed in SCIENCE.

(4) A statement showing receipts and disbursements for the entire period of the treasurer's incumbency, from August 31, 1894, to September

30, 1922, was accepted by the council and ordered printed in SCIENCE.

(5) The permanent secretary's audited annual financial report for the fiscal year 1922 (from October 1, 1921, to September 30, 1922) was accepted by the council and ordered printed in SCIENCE.

(6) The permanent secretary's budget for the fiscal year 1923 was approved by the council.

(7) It was reported by the general secretary that a large majority of the members of the association residing in Colorado desired to have that state included in the area of the Southwestern Division. The council therefore amended Article VI, Section 3, of the by-laws to that effect by inserting the word *Colorado* after the word *New Mexico*.

(8) It was voted by the executive committee that a message of greeting should be sent to the treasurer, Dr. Woodward, who was unable to be present at the meeting.

(9) A report from the special committee on the status of the evolution theory (E. G. Conklin, *chairman*, Henry F. Osborn and C. B. Davenport) was accepted by the council, and a set of resolutions recommended by that committee were adopted.

(10) The special committee on cooperation with Organizations of Mexican Men of Science (L. O. Howard, *chairman*) presented a report of progress, which was accepted by the council.

(11) A report of the special committee on Convocation Week (J. McKeen Cattell, *chairman*), which had been approved by the executive committee at its fall meeting, 1922, and which had been published in SCIENCE for December 1, 1922, was accepted by the council and the six resolutions therein recommended (on future meetings of the association) were adopted, the council voting separately on each resolution.

(12) It was voted by the council that the summer meeting for 1923 be held at the University of Southern California, Los Angeles, in conjunction with the Pacific Division and the Southwestern Division, this meeting to occur at a time in September, 1923, to be decided upon by the executive committee.

(13) The executive committee instructed the permanent secretary to send a communication to the British Association for the Advancement of Science, expressing the gratification of the American association that the British association is to meet in Toronto in the summer of 1924.

(14) The council elected two members to emeritus life membership, on the Jane M. Smith Foundation, the new life members being Dr. T. C. Chamberlin and Dr. Harvey W. Wiley.

(15) Eighty members of the association were elected to fellowship, distributed among the sections as follows: Section B, 3; Section C, 1; Section E, 5; Section F, 2; Section G, 44; Section I, 6; Section L, 2; Section N, 12; Section O, 5.

(16) A communication was presented to the executive committee by Mr. S. A. Moss, of the General Electric Company, Lynn, Mass., requesting the association to appoint representatives in the American Committee on the Standardization of Mathematical Symbols used in Engineering, etc. The appointment of three members was authorized, these to be named later by President McMurrich.

(17) The question of places of future meetings of the association was referred by the executive committee to a special committee, consisting of the general secretary, the permanent secretary and J. McKeen Cattell, with instructions to report at the spring meeting of the executive committee.

(18) The executive committee expressed its approval of the general aims of the newly organized Sigma Delta Epsilon Graduate Women's Scientific Fraternity, with the hope that the fraternity may be admitted to association with the American Association for the Advancement of Science at a later time, when it shall have become more thoroughly established.

(19) In response to a communication from the chairman of the Committee on Bibliography (Dr. C. B. Davenport), the executive committee adopted the following resolution: *Resolved*, That the executive committee regards it as desirable that a committee on bibliography be maintained in the American Association for the Advancement of Science, and requests the chairman of the present committee on that subject to consult with the members of his committee regarding possible work still to be accomplished for the association by such a committee, and to report subsequently on this matter to the executive committee.

(20) In response to a communication from the League of Nations, the council adopted a resolution expressing its sincere interest in the restoration of the University of Vienna to its former high rank and in the rehabilitation of Austrian scientific work in general.

(21) The executive committee considered a communication from the General Federation of Women's Clubs, dealing with the need of more and better nature study in American schools, and referred this to the section committee of Section Q, with the request that the section committee make recommendations to the executive committee in this regard.

(22) The executive committee authorized the

appointment, by the chair, of a special committee to consider the need of more and better American reviews of scientific publications, with the request that the special committee make recommendations to the executive committee in this regard. President McMurrich appointed the following three members of the special committee just mentioned, with the provision that these three shall appoint two more members, thus giving the committee a membership of five. The three members appointed are: W. J. Humphreys, *chairman*, D. T. MacDougal and J. McKeen Cattell. This committee is to appoint the two additional members.

(23) The executive committee authorized the permanent and general secretaries to make arrangements by which the preliminary announcements of association meetings may be distributed as second-class mail matter.

(24) In response to a communication from H. A. Spoehr, W. T. Bovie and Edwin E. Slosson, the executive committee authorized the formation of a special committee to survey the field of photosynthesis and to arrange for the cooperation of workers in fields related to this subject, with the aim of accelerating the advance of our knowledge of the photosynthetic process. It was voted that the formation of this committee be placed in the charge of the general secretary.

(25) The council appropriated the sum of $4,000 for grants in aid of research, for the fiscal year 1923, these moneys to be disbursed by the treasurer from the appropriable funds in his hands, according to allotments to be made by the committee on grants.

(26) The council voted that the president appoint a special committee of five to consider the question of the organization of work in the philological sciences in connection with the association, this committee to be announced at the spring meeting of the executive committee. Professor Mark H. Liddell, of Purdue University, was designated as secretary *pro tem* of the special committee.

(27) The council accepted a report presented by the committee on Reciprocity in Science between Canada and the United States, and the two resolutions recommended by the committee were adopted.

(28) The council adopted a resolution favoring the use of the metric system of weights and measures in the United States, and urging scientific men to employ metric units in all their publications, either exclusively or else with the customary non-metric units in parentheses.

(29) At the council session on Thursday, December 28, it was voted that Henry B. Ward and Herbert Osborn should serve as representatives of the council to attend the meetings of the American Society of Naturalists and the American Society of Zoologists, on Friday morning, these representatives being instructed to take part in the consideration of the proposed union of American biological societies.

(30) The council again expressed the desire of the association to cooperate in all feasible ways in the plans for a union of American biological societies, and affirmed its willingness to join in the particular plan proposed, provided (*a*) that the societies originally invited do so, and (*b*) that the expense to the association does not exceed $200 for the first year.

(31) The council accepted and adopted a report of the special committee on United States Copyright Laws (Clement W. Andrews, *chairman*), approving the main purpose of H. R. Bill 11476, now before the U. S. Congress, but strongly urging the elimination of Section 6, or the limitation of its application to importations in bulk.

(32) A resolution on Indian lands in the United States was considered by the council and was referred to the executive committee with power.

(33) A resolution concerning geological features of city parks was considered by the council and was referred to a special committee, to be appointed by the president, with the recommendation that the resolution be made to include all natural features in city parks. The special committee is to make recommendations to the executive committee in this regard. Its members have not yet been named.

(34) By a unanimous vote of the council, Charles D. Walcott, secretary of the Smithsonian Institution, was elected president of the association for the calendar year 1923.

(35) The following vice-presidents of the association were elected by the council, for the calendar year 1923:

For Section A (Mathematics), Harris Hancock, professor of mathematics, University of Cincinnati.

For Section B (Physics), W. F. G. Swann, professor of physics, University of Chicago.

For Section C (Chemistry), E. W. Washburn, chairman of Division of Chemistry and Chemical Technology, and editor-in-chief of *International Critical Tables;* National Research Council. Washington, D. C.

For Section E (Geology and Geography), N. M. Fenneman, professor of geology and geography, University of Cincinnati.

For Section F (Zoological Sciences), E. L.

Rice, professor of zoology on the Cincinnati Conference Foundation, Ohio Wesleyan University, Delaware.

For Section G (Botanical Sciences), Charles J. Chamberlain, professor of morphology and cytology, Department of Botany, University of Chicago.

For Section H (Anthropology), E. A. Hooton, assistant professor of anthropology, Harvard University, and curator of somatology, Peabody Museum of Archæology and Ethnology, Cambridge, Massachusetts.

For Section I (Psychology), Raymond Dodge, professor of psychology, Wesleyan University, Middletown, Connecticut.

For Section K (Social and Economic Sciences), John F. Crowell, economist, 30 Church Street, New York City.

For Section O (Agriculture), R. A. Pearson, president, Iowa State College, Ames.

(36) The council referred to the executive committee, with power, the election of vice-presidents for the sections D, L, M, N and Q, from which sections vice-presidential nominations were not yet at hand.

(37) The following section secretaries were elected by the council, for the remainder of the four-year term ending at the close of the next Washington meeting (December, 1924):

Section C (Chemistry), W. D. Harkins, professor of chemistry, University of Chicago.

Section H (anthropology), R. J. Terry, professor of anatomy, Washington University School of Medicine, St. Louis, Missouri.

Section Q (Education), A. S. Barr, assistant director in charge of instruction, Board of Education, Detroit, Michigan.

(38) The following council members were elected by the council, for terms expiring at the end of the calendar year 1926:

H. L. Fairchild, emeritus professor of geology, University of Rochester.

G. A. Miller, professor of mathematics, University of Illinois, Urbana.

(39) The following members of the executive committee were elected by the council, for terms expiring at the end of the calendar year 1926:

J. McK. Cattell, editor of SCIENCE, Garrison-on-Hudson, N. Y.

Henry B. Ward, professor of zoology, University of Illinois, Urbana.

(40) The council elected the following members of the Committee on Grants for Research, for terms expiring at the end of the calendar year 1926:

W. D. Harkins (for chemistry), professor of chemistry, University of Chicago.

Frank Schlesinger (for mathematics and astronomy), director, Yale University Observatory, New Haven, Connecticut.

(41) The council gave a rising vote of thanks to Dr. J. Playfair McMurrich, for the fine and tactful efficiency with which he had served as chairman of the council during the Boston meeting.

(42) The council instructed the permanent secretary to write letters of appreciative thanks to the local committee for this meeting, to the Massachusetts Institute of Technology and Harvard University, to the Mayors of Boston and Cambridge, and to Messrs. Ginn and Company for the parts they have taken in making the fourth Boston meeting a success.

FINANCIAL REPORTS

The annual report of the treasurer of the association, to September 30, 1922, will be published in a later issue of SCIENCE. The total of the permanent funds now amounts to $121,414.77. The appropriable income from this endowment was $5,812.52 for the calendar year 1922. Of this, $4,000 was appropriated at the Boston meeting, for grants, and $200 for emeritus life memberships.

The permanent secretary's financial report for the fiscal year 1922 shows a total of $69,390.21, representing receipts from all sources, including balances from the preceding year, and the item of total expenditures is shown as $62,314.13, including $5,430.43 paid on account of the publication of the last volume of proceedings. The last mentioned item is not properly chargeable to the current expenses of 1922, for it represents the years 1915 to 1921. At the beginning of the year 1922 the emergency fund amounted to $4,355.09 and it contained $5,997.68 at the end of the year. The current balance at the end of 1922, not including emergency fund, amounted to $1,078.40. This report will be published in a later issue of SCIENCE.

The permanent secretary's budget of prospective expenditures during the fiscal year 1923 amounts to $56,158.00. The items of the budget will be published later in SCIENCE.

FELLOWSHIP ELECTIONS

THE by-laws of the association state: "All members who are professionally engaged in scientific work, or who have advanced science by research, may be elected by the council to be

fellows on nomination or on their own application. This qualification is understood to have been met by members of affiliated societies having a research qualification."—*Article II, Section* 4. Certain officers of the association must be elected from among the fellows.

Each newly elected fellow receives a notification of election and a certificate of fellowship. In the published membership lists the name of each fellow is preceded by an asterisk. On the addressograph plates used by the permanent secretary's office in addressing members there always occurs a membership symbol showing the years of the member's election to membership, to fellowship and to life membership. The formula 17F19L20, for example, denotes membership since 1917, fellowship since 1919, life membership since 1920. If a fellow allows his membership to lapse, or if he resigns, and is subsequently elected to membership as a new member, he is automatically entered in the lists as a fellow on the basis of his first election. It therefore sometimes occurs that a membership symbol shows an earlier year for fellowship than for membership. Fellows should not allow their membership to be discontinuous, however; a long, unbroken record in the association may well be considered as a legitimate subject for some personal pride. Fellows are asked to inform the permanent secretary promptly regarding any errors that may occur in the membership symbols on their addressograph plates.

Nominations for fellowship are made on special fellowship nomination blanks, which may be secured from any section secretary or from the permanent secretary's office. Nominations may be sent in to the proper section secretary or to the permanent secretary at any time. They are first referred to the secretary of the proper section, who, after investigation, makes recommendation to the executive committee in each case. Cases in which a nomination is not approved by the section secretary may be referred by the executive committee to the Committee for Reference on Fellowship Nominations, which, after investigation, makes recommendation to the executive committee. The executive committee makes elections to fellowship at its spring and fall meetings. At the annual meeting of the association the executive committee makes recommendation to the council regarding fellowship nominations to be acted upon at that time. Consequently, for each fiscal year there are generally three lists of fellowship elections, one for the fall meeting of the executive committee, one for the annual meeting of the council and one for the spring meeting of the executive committee.

It seems desirable that the matter of fellowship be given very serious attention, and it is hoped that all members will cooperate with the secretaries to the end that every one who is eligible to fellowship shall be nominated. Beginning with the fiscal year 1923, it is planned that the names and addresses of all newly elected fellows shall be published in SCIENCE.

RESOLUTIONS ADOPTED BY THE COUNCIL

A STATEMENT ON THE PRESENT SCIENTIFIC STATUS ON THE THEORY OF EVOLUTION

Inasmuch as the attempt has been made in several states to prohibit in tax-supported institutions the teaching of evolution as applied to man, and

SINCE it has been asserted that there is not a fact in the universe in support of this theory, that it is a "mere guess" which leading scientists are now abandoning, and that even the American Association for the Advancement of Science at its last meeting in Toronto, Canada, approved this revolt against evolution, and

Inasmuch as such statements have been given wide publicity through the press and are misleading public opinion on this subject,

Therefore, the council of the American Association for the Advancement of Science has thought it advisable to take formal action upon this matter, in order that there may be no ground for misunderstanding of the attitude of the association, which is one of the largest scientific bodies in the world, with a membership of more than 11,000 persons, including the American authorities in all branches of science. The following statements represent the position of the council with regard to the theory of evolution.

(1) The council of the association affirms that, so far as the scientific evidences of the evolution of plants and animals and man are concerned, there is no ground whatever for the assertion that these evidences constitute a "mere guess." No scientific generalization is more strongly supported by thoroughly tested evidences than is that of organic evolution.

(2) The council of the association affirms that the evidences in favor of the evolution of man are sufficient to convince every scientist of note in

the world, and that these evidences are increasing in number and importance every year.

(3) The council of the association also affirms that the theory of evolution is one of the most potent of the great influences for good that have thus far entered into human experience; it has promoted the progress of knowledge, it has fostered unprejudiced inquiry, and it has served as an invaluable aid in humanity's search for truth in many fields.

(4) The council of the association is convinced that any legislation attempting to limit the teaching of any scientific doctrine so well established and so widely accepted by specialists as is the doctrine of evolution would be a profound mistake, which could not fail to injure and retard the advancement of knowledge and of human welfare by denying the freedom of teaching and inquiry which is essential to all progress.

A RESOLUTION REGARDING THE DESIRABILITY OF THE METRIC SYSTEM OF WEIGHTS AND MEASURES FOR THE UNITED STATES

Whereas, The metric system of weights and measures has not yet been brought into general use in the United States, and

Whereas, The American Association for the Advancement of Science has already adopted and published resolutions favoring the adoption of the metric system of weights and measures in the United States; therefore be it

Resolved, That the American Association for the Advancement of Science reaffirms its belief in the desirability of the adoption of the metric system of weights and measures for the United States, and recommends that the units of that system be used by scientific men in all their publications, either exclusively or else with the customary non-metric units in parentheses.

RESOLUTIONS ON THE INTERNATIONAL SCIENTIFIC RELATIONS BETWEEN CANADA AND THE UNITED STATES

Presented by the Committee on Reciprocity in Science between Canada and the United States.

I. Resolution on Marine Mammals

In view of the fact that the American Association for the Advancement of Science is international in its scope and interests,

The council of the association recommends that the National Academy, the National Research Council, the Royal Society of Canada and the Honorary Council for Scientific and Industrial Research be requested to exert their influence in inducing the governments concerned to consider the advisability of taking such steps as may be necessary for the better conservation of marine mammals and the further study of their life histories.

II. Resolutions on the Complete Conservation of Certain Areas

Whereas, The American Association for the Advancement of Science has a special committee on reciprocity in science between Canada and the United States, and

Whereas, The committee just mentioned has made a study of the problem of the preservation of floral and faunal areas in North America, and has recommended the following resolutions to the association; therefore, be it

Resolved, That the council, acting for the association, heartily supports the plan for complete conservation of certain areas, especially those which contain peculiarly interesting representations of floras and faunas and natural features of special interest in the educational sense, or subjects which may be desired for the conduct of future researches. And, be it further

Resolved, That the definition of this principle is not to be confused with commitment in support of specific areas without careful study of all factors, including those which relate to the proper balance between conservation and utilization.

A STATEMENT REGARDING PROPOSED COPYRIGHT LEGISLATION IN THE UNITED STATES

There has been introduced in the present United States Congress a bill (H. R. 11476) which has for its main purpose the removal of the present restriction of copyright in the United States to books printed in this country. The removal of this restriction would give authors, foreign as well as American, the protection which all important civilized nations except the United States, Russia and Mexico now give through the Berne Convention. The association heartily approves this action and endorses those provisions of the bill which secure it.

Unfortunately, however, the bill contains a section which has an entirely different purpose. Section 6 in its original form provided that, with a few exceptions of no importance in the present discussion, no copies of the original edition could be imported by any one except through the holder of the American rights. It is understood that this section was inserted at the instance of certain publishing houses and as the price of their support of the bill. In the opinion of the council of the association, after thorough inquiry and study by a special committee of the association, this is a most serious menace to American scholarship and to the Amer-

ican reading public. Although it is not probable that this bill will be acted upon during the present session of the Congress, yet the importance of the subject and of the interests affected make it desirable that the association shall consider and record their opinion of certain of its provisions.

The section mentioned applies to books by a foreign author published in this country under assignment of the United States Copyright, but it makes no definition of what constitutes "publication." This means that any importing house can, by merely having its name put on the title-page of a small number of copies, completely control the importation of the work and fix the American price without competition. In its original form, this provision applied to all copies of all books so protected, but after a conference between representatives of the publishers and of the libraries, a substitute section has been introduced, which exempts books in foreign languages and secondhand copies. Even when thus limited, the provision would cause very great damage to the interests of individual scholars and to educational institutions and would be contrary to the provision of the Constitution of the United States which gives Congress power to enact copyright legislation "to promote the progress of science and useful arts."

There are three important reasons why the council of the association wishes to be recorded as strongly objecting to the provisions of the substitute section just considered. These reasons are as follows:

First, There is no requirement of simultaneous publication, and, even if importations could be made before the exclusion of original copies became effective, it is evident that there could be no certainty as to the time available and no assurance that copies ordered in perfect good faith would not be confiscated on arrival. Moreover, the existence of an American edition would have to be determined for each particular case—a serious burden on individual scholars, an almost intolerable one on educational institutions, and, it may be supposed, an almost intolerable one on the United States Treasury officials.

Second, The bill recognizes the fact that the original edition may be more desirable than the American one and provides a means of obtaining the former through the holder of the American copyright, or independently if he refuses to agree to supply, yet it fails to specify any time limit within which the agreement must be carried out. Here, also, it is evident that the proposed provisions would cause serious delay, much correspondence and many formalities.

Third, There is nothing in the bill about the price at which the original edition would be supplied. What that omission would result in is evident from the present practice of certain American representatives of English houses whose American prices for books not so protected is out of all proportion to the corresponding English prices.

In conclusion, the council of the association heartily approves the main purpose of the bill here considered, but urges most strongly the elimination of Section 6, or the limitation of its application to bulk importations that would compete with the American edition in the open market; and the council directs that this statement of its position be communicated to the proper congressional committees whenever the bill shall be taken under consideration.

RESOLUTION ON THE STATUS OF AUSTRIAN SCIENCE

Resolved, That, in reply to the communication from the Committee on Intellectual Co-operation, of the League of Nations, the Council of the American Association for the Advancement of Science expresses its sincere interest in the restoration of the University of Vienna to its former high rank among the universities of the world, and recommends that the association and American men of science cooperate in all possible ways with the Austrian men of science in promoting their scientific work.

RESOLUTIONS ON THE PLANNING OF FUTURE MEETINGS OF THE ASSOCIATION

1. *Resolved,* That the greater convocation-week meetings of the American Association for the Advancement of Science and the affiliated national scientific societies be continued as for the past twenty years at four-year periods in succession in Washington, New York and Chicago, and that all national scientific societies be invited and urged to join in these meetings.

2. *Resolved,* That a corresponding twelve-year cycle of meetings for the intervening two-year periods be arranged for large cities in succession in the New England, the Central and the Atlantic states, in which it is desirable that the national scientific societies join.

3. *Resolved,* That a provisional schedule of meetings in other cities for the odd years be arranged in advance, for the convenience of the scientific societies that may find it desirable to meet with the association.

4. *Resolved,* That arrangements be made for a summer meeting in 1923.

5. *Resolved,* That scientific councils, boards and committees can to advantage hold their meetings in Washington during the fourth week

of April, in New York at the end of Thanksgiving week, in Chicago on or about February 1, and in Woods Hole in August.

6. *Resolved*, That convocation-week be the week in which New-Year's day falls when this is Thursday, Friday or Saturday; that when New Year's day falls on Sunday, it be the preceding week; that when it falls on Monday, Tuesday or Wednesday, it begin two days after Christmas and continue into New Year's week.

Note.—According to the provisions of the sixth resolution, the dates of future annual meetings of the association for the fiscal years given are provisionally established as follows:

1924 (Cincinnati) — Thursday, December 27, 1923, to Wednesday, January 2, 1924.

1925 (Washington)—Monday, December 29, 1924, to Saturday, January 3, 1925.

1926 (Kansas City)—Monday, December 28, 1925, to Saturday, January 2, 1926.

1927 (———)—Monday, December 27, 1926, to Saturday, January 1, 1927.

1928 (———)—Monday, December 26, to Saturday, December 31, 1927.

1929 (New York)—Thursday, December 27, 1928, to Wednesday, January 2, 1929.

THE BOSTON SESSIONS OF SECTIONS AND SOCIETIES

INTRODUCTORY NOTE

AN attempt has been made this year to secure readable accounts of all of the section and society programs for publication in this special issue of the association journal. Several kinds of difficulty have been encountered, however, and it must be admitted that the following array of section and society reports leaves ample verge for future improvement in this aspect of our post-convention work. It is planned to follow, in coming years, the general plan now introduced for the first time, bringing together all the reports of each annual meeting in a special issue of SCIENCE, to appear in January as early as may be. Those who read the following accounts are therefore requested to consider ways and means by which more satisfactory reports may be secured at the close of the Cincinnati meeting a year hence. The permanent secretary will be glad to receive suggestions that may result in a more efficient cooperation of all concerned than has been possible this year.

Before the approach of the autumn period of hectic activities in association affairs, each section secretary was asked to cooperate to secure the needed reports at the close of the meeting. It was emphasized that each section secretary represents the association in its program relations with the societies in his own field that meet with the general organization, and section secretaries were asked to see to it that all of the societies in their respective groups were properly cared for with respect to the prospective preparation of the needed reports. The attention of society secretaries was subsequently called to our plans, and they were requested to cooperate with their section secretaries in this regard. After several other notifications and requests in this same direction all secretaries were asked to have reports of all their sessions ready for publication before leaving Boston. About five or six reports were actually in the permanent secretary's hands at the close of the meeting. Many additional reports were received between the close of the meeting and January 7, on which date a telegraphic request was sent to each secretary whose report had not already arrived. Our telegraph bill for January 7 was over sixteen dollars. The following series of reports had to be closed January 15, and we have included all the material on hand at that time.

The novelty of this plan is perhaps an important item in the explanation of the difficulties encountered. Although we all agree that the association should be greatly improved in its service to the societies and to its members and the public, yet conservatism (or just inertia) must be overcome whenever any marked improvement in our work is instituted. That things "always have been done" in a certain way is not infrequently encountered as a reason for persisting in a more or less unsatisfactory practice. We scientists are just human in this respect.

Besides the difficulty of novelty, we have had to cope with other kinds of difficulty. Some secretaries confessed their inability to prepare or get prepared, brief, readable reports on such heterogeneous series of topics as generally constitute a scientific program. It seemed to some that every paper read ought to be reported, which is clearly impossible as well as undesirable. Some wished to repeat the programs as published in the general program.

On the whole, however, it seems that the following reports represent a considerable achievement, and the permanent secretary and the assistant secretary wish to express their thanks to all who have contributed thereto. Besides serving their present purpose, this collection of reports may well be valuable as a starting point for better plans that may lead to the securing of still more satisfactory reports next year.

The reports are arranged below in the order of the sections to which they pertain (the letter-and-number symbols being the ones used in the general program. The letters correspond to the several sections of the association, and the several organizations are numbered serially in each letter group, beginning with the section organization itself.

Special attention is called to the following statement from the Boston Preliminary Announcement: The general program of the fourth Boston meeting may be obtained free by members in good standing if they will write to the permanent secretary and enclose five cents in stamps to pay postage. Requests for programs will be complied with as long as the supply lasts.

SECTION A—MATHEMATICS

Vice-president and chairman, G. A. Miller.
Retiring vice-president, Oswald Veblen.
Secretary, William H. Roever, Washington University, St. Louis, Mo.

(Report by William H. Roever)

The retiring presidential address for the association as a whole was this year devoted to a mathematical subject. Retiring President E. H. Moore delivered his address at the first general session on Tuesday evening, December 26, on the subject "What is a number system?"

The American Mathematical Society and the Mathematical Association of America met with the American Association. Besides several sessions of their own, which are reported below, there were two joint sessions with Section A.

On Wednesday, December 27, in Room 2-190 at the Massachusetts Institute of Technology, Section A of the American Association for the Advancement of Science and the American Mathematical Society held a symposium on "Space and time," at which three aspects of the subject were considered under the following titles: "The logic of space and time" by G. D. Birkhoff; "The physical meaning of space and time," by P. W. Bridgman; "The astronomical measures of space and time," by Harlow Shapley.

On Thursday afternoon, at Harvard University, Section A, with the American Mathematical Society and the Mathematical Association of America, held a joint session, at which addresses were given by representatives of these organizations. The titles of these addresses follow: "Reduction of singularities of plane curves by birational transformation," address of retiring president of the American Mathematical Society, G. A. Bliss, University of Chicago; "The grafting of the theory of limits on the calculus of Leibniz," by Florian Cajori, University of California (representing the Mathematical Association of America); "Geometry and physics," address of the retiring vice-president for Section A, American Association for the Advancement of Science, Oswald Veblen, Princeton University.

At a meeting of the Section Professor Harris Hancock, of the University of Cincinnati, was nominated for vice-president of the Section, to preside at the meeting in Cincinnati and to give his retiring address at the meeting in Washington. Professor W. A. Hurwitz, of Cornell University, was elected to membership on the Section committee, to serve for four years, taking the place of Professor G. A. Bliss, whose term expired with the Boston meeting. On Thursday evening, December 28, a joint dinner was given to all visiting mathematicians.

THE AMERICAN MATHEMATICAL SOCIETY

Chairman, G. A. Bliss.
Secretary, R. G. D. Richardson; Brown University, Providence, R. I.

(Report by R. G. D. Richardson)

The twenty-ninth annual meeting of the American Mathematical Society was held at Harvard University, Cambridge, on December 27 and 28, 1922. The attendance included one hundred and forty-five members of the society. It was announced that ten members of the London Mathematical Society had joined the society under the reciprocity agreement, and the election of twenty-two other members was announced.

The total membership in the society is now 1,100, including eighty-three life members. The treasurer's report shows expenditures of $7,858.07 and cash receipts of $10,486.21 during 1922; it is to be noted, however, that on account of the printing situation no numbers of the *Transactions* have been paid for during this year. The total number of volumes in the library is now 6,203.

At the annual election the following officers and other members of the council were elected: *President,* Professor Oswald Veblen; *vice-presidents,* Professors R. L. Moore and H. W. Tyler; *secretary,* Professor R. G. D. Richardson; *treasurer,* Professor W. B. Fite; *librarian,* R. C. Archibald; *committee of publication,* Professors E. R. Hedrick, W. A. Hurwitz and J. W. Young; *members of the council to serve until December, 1925,* Professors E. T. Bell, W. H. Bussey, J. C. Fields and Arthur Ranum.

It was decided to hold the summer meeting of 1923 at Vassar College and the annual meeting in New York City. Professors C. N. Moore and R. G. D. Richardson were appointed to represent the Society in the Council of the American Association for the Advancement of Science. Professor G. A. Bliss was appointed as *ad interim* representative on the American Section of the International Mathematical Union.

As noted above in the report of Section A, a joint session was held with that organization on Wednesday afternoon, and another with the Mathematical Association and Section A, on Thursday afternoon.

THE MATHEMATICAL ASSOCIATION OF AMERICA

President, R. C. Archibald.

Secretary, W. D. Cairns, Oberlin College, Oberlin, Ohio.

(Report by W. D. Cairns)

Following the joint session with Section A and the American Mathematical Society, the association held two sessions on Friday, December 29, 1922. The attendance at the sessions numbered 216, of whom 150 were members. The following officers for 1923 were elected or appointed:

President, Professor R. D. Carmichael, University of Illinois; *vice-presidents,* Chancellor A. B. Chace, Brown University, and Professor L. P. Eisenhart, Princeton University; *trustees,* Professor R. C. Archibald, Brown University, Professor C. F. Gummer, Queen's University, Professor Dunham Jackson, University of Minnesota, Professor E. H. Moore, University of Chicago, and Professor Clara E. Smith, Wellesley College; *secretary-treasurer,* Professor W. D. Cairns, Oberlin College; *librarian,* Professor L. C. Karpinski, University of Michigan.

Professor H. L. Rietz of the University of Iowa was appointed representative of the association in the Division of the Physical Sciences, National Research Council, for the three-year term beginning June 11, 1923. Twenty-seven persons and one institution were elected to membership.

The following papers were read at the Friday sessions, the afternoon session consisting of a symposium on "Mathematical statistics" with an extended discussion accompanying this: "Period of the bifilar pendulum for finite amplitudes," by H. S. Uhler; "Skew squares," by W. H. Echols; "On the averaging of grades," by C. F. Gummer; "Mathematics at Oxford and the Ph. D. degree," by W. R. Burwell; "Some unsolved problems in the theory of sampling," by B. H. Camp; "Some unsolved problems in solid geometry," by J. L. Coolidge; "The subject matter of a course in mathematical statistics," by H. L. Rietz; "Time series of economic statistics: their fluctuation and correlation," by Warren M. Persons; "Some fundamental concepts of the calculus of mass variation and their relations to practical problems," by Arne Fisher.

SECTION B—PHYSICS

Vice-president and chairman, F. A. Saunders.

Retiring Vice-president, G. W. Stewart.

Secretary, S. R. Williams.

Acting Secretary, Otto Koppius, Oberlin College, Oberlin, Ohio.

(Report by Otto Koppius)

Section B of the American association held its session on Thursday afternoon, December 28, at the Jefferson Physical Laboratory of Harvard University, Dr. F. A. Saunders presiding. The large lecture room of the laboratory was filled to its capacity.

Professor G. W. Stewart, of the State University of Iowa, the retiring vice-president for Section B, delivered his address on "Certain allurements in physics."[1] The allurements today are mainly in the following fields: Atomic structure and the theory of radiation, static *vs.*

[1] See SCIENCE, Vol. LVII, pp. 1-6, 1923.

the orbit theory of the atom, Quantum theory. And yet, Professor Stewart pointed out, the older fields are not without their allurements; they may be less attractive, but the achievements are likely to be more permanent. The vice-presidential address was followed by a symposium on "Ionization potentials and atomic radiation," in which the following papers were read: "The interpretation of critical potentials," by K. T. Compton; "Atomic structure and spectroscopic consideration," by Paul D. Foote; "Ionization and astrophysics," by Henry Norris Russell.

At the business meeting of Section B, Dr. W. F. G. Swann, of the University of Minnesota, was nominated vice-president for the section for 1923, and Dr. A. H. Compton, of Washington University, St. Louis, Mo., was elected to be a member of the section committee, his term of office to end January 1, 1927.

THE AMERICAN PHYSICAL SOCIETY

President, Theodore Lyman.

Secretary, Dayton C. Miller; Case School of Applied Science, Cleveland, Ohio.

(Report by Dayton C. Miller)

The twenty-fourth annual meeting (one hundred and eighteenth regular meeting) of the American Physical Society was held in Cambridge, Massachusetts, on Wednesday, Thursday and Friday, December 27, 28 and 29, 1922. The sessions on Wednesday and Friday were held in Room 4-270 of the Massachusetts Institute of Technology, and the sessions of Thursday were held in the lecture room of the Jefferson Physical Laboratory of Harvard University. The presiding officers were Theodore Lyman and C. E. Mendenhall, president and vice-president of the society, respectively. On Thursday morning, there was a joint session with the American Astronomical Society. On Thursday afternoon, the annual joint session with Section B, American Association for the Advancement of Science, was held, Professor F. A. Saunders, chairman of Section B, presiding. The attendance of members and friends varied from two hundred to two hundred and fifty. On the evening of Friday, December 29, there was a dinner of members of the society and friends at the Harvard Union, attended by about two hundred persons. The arrangements made by the local committee for the entertainment of the members were most excellent, and the meeting was generally considered one of the most successful that the society has held. There were numerous receptions, exhibitions and excursions arranged in connection with the general program of the American Association for the Advancement of Science, which were taken advantage of, as far as possible, by the members of the society

The program of the Physical Society consisted of sixty-seven regular papers, three of which were read by title. Six papers from the program of the American Astronomical Society were presented at the joint session, and at the session with Section B there was an address by the retiring chairman entitled, "Certain allurements in physics." This was followed by a symposium on "Ionization potentials and atomic radiation," consisting of three addresses, as follows: "The Interpretation of critical potentials," by K. T. Compton, Princeton University; "Atomic structure from spectroscopic consideration," by Paul D. Foote, Bureau of Standards, and "Ionization and astrophysics," by Henry Norris Russell, Princeton University.

The regular annual business meeting of the American Physical Society was held on Friday morning, December 29, at 11 o'clock. A canvass of the ballots for officers resulted in elections as follows for the year 1923:

President: Charles E. Mendenhall, University of Wisconsin.

Vice-president: Dayton C. Miller, Case School of Applied Science.

Secretary: Harold W. Webb, Columbia University.

Treasurer: George B. Pegram, Columbia University.

Members of the council, four-year term: F. C. Brown, Bureau of Standards; A. Ll. Hughes, Queen's University.

Managing editor of the Physical Review, three-year term: G. S. Fulcher, Corning, N. Y.

Members of the board of editors of the Physical Review, three-year term: A. H. Compton, Washington University; E. H. Kennard, Cornell University; Leigh Page, Yale University.

THE AMERICAN METEOROLOGICAL SOCIETY

President, Sir Frederic Stupart.

Secretary, Charles F. Brooks; Clark University, Worcester, Mass.

(Report by Otto Koppius.)

Sessions were held at the Massachusetts Institute of Technology, beginning Friday morn-

ing, December 29, and continuing through Saturday. At the annual business meeting the society re-elected the retiring officers: *President,* Sir Frederic Stupart, 315 Bloom Street, Toronto, Canada; *vice-president,* W. J. Humphreys, U. S. Weather Bureau, Washington, D. C.; *secretary-treasurer,* Charles F. Brooks, Clark University, Worcester, Mass. The Friday afternoon session was featured with a symposium on "Anemometry," at which S. P. Ferguson and R. N. Covert, of the U. S. Weather Bureau, Washington, D. C., presented a paper on "The measurement of the wind." The other contribution was by Alexander McAdie, Harvard University, Blue Hill Observatory, Readville, Mass. He exhibited and explained the barometer and the thermometer used by Dr. John Jeffries in 1784 when he made the first crossing of the English Channel by air. S. P. Ferguson opened the discussion after the reading of these papers. On Saturday morning, December 30, Sir Frederic Stupart gave his presidential address on "Meteorological stations in high latitudes." A prolonged and active discussion by numerous members of the society followed the address, particularly in regard to extending the network of meteorological stations into the polar regions and over the oceans. The society considered itself fortunate to have had at its meetings the heads of the meteorological services of both the United States and Canada, as well as a former director of this service for Argentina. The feeling is that the sessions were extremely helpful and stimulating.

The consensus of opinion is that the Boston meetings were exceedingly interesting and inspiring, and all the sessions were well attended. The success of the meeting was largely due to the untiring work of the local committee, and to the cordiality and hospitality of the Massachusetts Institute of Technology and Harvard University. Both of these institutions were given votes of appreciation by societies associated with Section B.

SECTION C—CHEMISTRY

Vice-President and Chairman, W. Lash Miller.

Retiring vice-president, William D. Harkins.

Secretary pro tem., William D. Harkins, University of Chicago.

(Report by W. D. Harkins)

There were six well-attended sessions for chemistry at the Boston meeting, the first on Wednesday forenoon and the last on Friday forenoon, with two simultaneous sessions on Thursday afternoon. All but the two last-mentioned sessions were devoted to a continued symposium on the "Progress of chemistry," and the two exceptions might properly be considered as also belonging with the large symposium. One of the Thursday afternoon sessions was held jointly with Section G (Botanical Sciences) and the Physiological Section of the Botanical Society of America, with a symposium of invited papers on "Photosynthesis in plants and other aspects of photochemistry." The other Thursday afternoon session was a joint one with Section B (Physics) and the American Physical Society, with the retiring vice-presidential address for Section B (given by G. W. Stewart, State University of Iowa) followed by a symposium of invited papers, arranged by the physicists, on "Ionization potentials and atomic radiation."

The address of W. D. Harkins, retiring vice-president of Section C, was given on Wednesday afternoon, on "Atomic structure and the general system of isotopes." The symposium on "Photosynthesis in plants and other aspects of photochemistry" embraced the following titles: "Inventory of the world supply of energy," by E. E. Slosson, Science Service, Washington, D. C.; "Analysis of the mechanism of photosynthesis," by H. A. Spoehr, Carnegie Institution of Washington; "The nature of photochemical reactions," by W. T. Bovie, Harvard Medical School; "Photochemical reaction," by S. E. Sheppard, Eastman Kodak Company, and "Carbohydrate metabolism," by Charles O. Appleman, University of Maryland.

This symposium was very largely attended and the papers proved to be very valuable and inspiring. The very great importance of photosynthesis in plants was specially emphasized, with the result that the section recommended to the council that a committee on this subject be organized, to make a survey of the field and aid research workers to cooperate in advancing our knowledge of the photosynthetic process as rapidly as possible. The council authorized such a committee and instructed the general

secretary to take steps to organize it.

It was the general opinion, expressed by those in attendance, that the program gave a most interesting and important summary of progress in chemistry, particularly with reference to those topics that are of most interest to other scientists and to the public. Most of the papers presented were discussed at length by the chemists present, and the discussion was enlivened by the witty and relevant remarks and suggestions of the chairman.

On nomination by the section, the council elected E. W. Washburn, of the National Research Council, to be the chairman of the section and association vice-president for the section, for 1923. On similar nomination W. D. Harkins was elected to be secretary of Section C for the remainder of the secretarial term, expiring at the end of the Washington meeting, December, 1924. Gerhard Dietrichson, of the University of Illinois, was elected assistant secretary, and two members of the section committee were elected, as follows: For the four-year term expiring at the end of 1925, Gregory Paul Baxter, Harvard University; for the four-year term expiring at the end of 1926, Roger Adams, University of Illinois.

A more complete report on the sessions of Section C at Boston will appear in a later issue of SCIENCE, as will also the vice-presidential address for the section.

SECTION D—ASTRONOMY

Vice-president and Chairman, Otto Klotz.

Retiring vice-president, S. A. Mitchell.

Secretary, F. R. Moulton, University of Chicago, Chicago, Ill.

(Report by F. R. Moulton)

Section D held its meeting on Friday afternoon, December 29, in joint session with the American Astronomical Society. In the absence of Professor S. A. Mitchell, his retiring vice-presidential address on "Some consequences of ionization" was read by Dr. Slocum. Other meetings were held, under the auspices of the American Astronomical Society, on Wednesday morning, Thursday morning and afternoon and Friday morning. The section was adjourned Wednesday afternoon to attend the symposium on "Space and time" given by Section A and the American Mathematical Society. On Wednesday evening the section and the American Astronomical Society were entertained by Dr. and Mrs. Shapley at the Harvard College Observatory.

At the business session of Section D, Dr. Heber D. Curtis, Allegheny Observatory, Pittsburgh, Pa., was nominated for vice-president for Section D for 1923, and Dr. Charles G. Abbott, of the Smithsonian Institution, Washington, D. C., was elected member of the sectional committee for the term expiring December 31, 1926.

THE AMERICAN ASTRONOMICAL SOCIETY

President, W. W. Campbell.

Secretary, Joel Stebbins, Washburn Observatory, Madison, Wis.

(Report by Joel Stebbins)

The American Astronomical Society had a successful meeting, about eighty members being present. Sessions were held on three days, and the society took the opportunity to join the meetings of other sections, including the symposium on "Space and time" of Section A and a joint session for papers of common interest with the American Physical Society. In the case of the physical papers a prominent physicist stated that anything he understood was probably astronomy and what he did not understand must have been physics. In a session with Section D the retiring address of Vice-president S. A. Mitchell on "The importance of ionization" included a practical summary of certain developments in modern physics which are of prime importance in their astronomical application.

In addition to the emphasis on physics, the meeting brought out about half a dozen papers in each of the following fields: astronomical spectroscopy, stellar parallaxes, positions and proper motions of stars, and double and variable stars. One might suppose that by the twentieth century astronomers would have learned all possible ways of setting up their instruments, but no less than three papers included notes on methods of adjustment of equatorial telescopes, special devices being occasioned by the new forms of instruments which are being brought into use.

In 1918 the society held at Cambridge what turned out to be a farewell meeting in honor of the late Professor Edward C. Pickering, director of the Harvard Observatory for more than forty years, and it was a satisfaction for the members to visit once more the scene of

his labors and see how the work is being carried on and extended by the new director, Dr. Shapley. Also the society was privileged to hold a session at the Harvard Astronomical Laboratory, where, under the late Professor Willson and his successor, Dr. Stetson, many innovations in the teaching of astronomy have been introduced.

Although the Boston meeting was not marked by the announcement of any striking astronomical discovery, the gathering was quite up to standard in the interest and benefits to astronomers themselves, both because of the quality of the technical papers and the opportunity of contact with workers in allied sciences.

SECTION E—GEOLOGY AND GEOGRAPHY

Vice-president and chairman, Hervey W. Shimer.

Retiring vice-president, Willet G. Miller.

Secretary, Elwood S. Moore, University of Toronto, Toronto, Ontario.

(Report by E. S. Moore)

Section E held a successful meeting with a program of three full days and an evening session in conjunction with the association, at which Dr. W. M. Davis gave a public lecture on the Grand Canyon. One of the gratifying features of the meeting was the interest manifested by the younger geologists and geographers, and it is regrettable that an abstract of each paper presented can not be published here.

In his paper on "Variations in rate of evolution of organisms," Dr. Shimer, vice-president, pointed out that characters of major importance such as those distinguishing classes, are introduced with comparative rapidity. Throughout the much longer subsequent life of the class, evolution, except for the few individuals which initiate the next great advance, is confined to the elaboration of minor characters. Such alternations in the rapidity of evolution may partly be explained by a parallel alternation in the physical environment throughout the history of the earth.

As an outcome of a paper given by Dr. W. M. Davis on the possibilities of developing geological features, for educational purposes, in city parks, a resolution was unanimously passed, urging that such possibilities be brought to the attention of park authorities concerned. Professor Davis pointed out features which might be used in some of the principal cities in the country. A few of the examples suggested are the glacial features in Central Park, New York, which could be exposed by removing the thin earth covering. Spokane might develop a magnificent section exhibiting the remnants of the great flood of Columbia lavas left lying unconformably on the spur of the Rocky Mountains. Another paper by Professor Davis, of exceptional interest, expressed his conclusions regarding the origin of the Drowned Coral Reefs south of Japan. The Tiu Kiu and Bonin islands are surrounded by coral banks 40 to 60 fathoms in depth, and these are believed to represent submerged coral reef plains, built up around the islands while they were slowly subsiding during a period of higher temperature than that existing at present. The corals are believed to have ceased work, owing to a fall in temperature. The submergence is assigned to a sinking of the islands, rather than to a rise of the sea, because the depths of the various banks are not the same. These islands are of skeleton outline with serrate backbone, from which slender rib-like spurs project on either side, between open bays. Barrier coral reefs are more or less developed around the more southern islands, while the middle island groups have only narrow and discontinuous fringing reefs. Professor Davis thinks that the margin of the coral seas fluctuated during glacial time and recently withdrew somewhat toward the equator.

Professor S. D. Townley exhibited views which showed that earthquakes are relatively more numerous in southern California than in the northern and central portion, and that there is really no reason why just as much care should not be taken in constructing earthquake-proof buildings in the southern cities as in San Francisco. Photographs showing destructive effects of earthquakes indicated that an earthquake near Lovelock, Nevada, occurred in an uninhabited region. If a city had happened to be located near it, great destruction would have resulted.

A map of California, showing the location of all faults, is being prepared as an aid to a more thorough study of seismology. Most people are inclined to think all modern earthquakes in the United States have occurred in the western portion of the country. Mr. I. B. Crosby

showed that a severe earthquake occurred in the vicinity of Boston in 1755, by which 1,200 chimneys were partially, or totally, destroyed in this region and some houses were nearly destroyed. This was the severest shock which has been recorded, but since then other shocks of lesser magnitude have occurred, and it is quite within the bounds of possibility that others may occur in the future. An interesting map, prepared by Mr. Crosby, shows the areas around Boston likely to suffer most from a shock, because of the characer of the underlying rock. Mr. R. W. Sayles presented undoubted evidence of the glacial origin of the beds at Squantum and other localities, and pointed out the relation between the regularly banded slates in a number of areas and the seasonal changes resulting from glaciation. Recent studies indicate the glacial origin of the Swanton conglomerate near St. Albans, Vt. Professor R. V. Field presented evidence to show that the Torridon sandstone in the northwest Highlands of Scotland, long regarded by the Scottish geologists as a typical desert deposit, is more correctly considered as a formation made up of confluent alluvial fans. From his account of his early geological work in the Red Deer district, Mr. J. B. Tyrrell fully established his claim to the honor of having discovered, in 1884, what is probably the most famous collecting ground in the world for dinosaurian remains.

Recent work by Professor Fairchild and others has shown that the southern limit of glaciation, as outlined by Lewis and generally accepted as correct, must be greatly modified, since this line did not include the extensive lobations running down most of the valleys. The ice reached as far south as Bethlehem and possibly to Reading, Pa. The masses of till left by these lobes do not represent pre-Wisconsin glaciation, but rather the fringe of the Quebec glacier. The topographic features of the lower Susquehanna valley can be best explained by assuming a peripheral bulge, which by isostatic compensation balanced the downthrow of the northern area, which was weighted down by the ice of the Quebec glacier. This bulge is calculated to have had a width of 200 miles and a crest elevation of 640 feet. Since glacial times the bulge has fallen about 200 feet, thus drowning the lower Susquehanna valley. The rise of this bulge implies a downthrow in Quebec during glacial times of 3,000 feet with a post-glacial uplift of 1,000 feet. Before glaciation the Quebec area stood 2,000 feet higher than to-day, or somewhat over 3,000 feet above sea level.

Other evidences of changes in level were discussed by Professor W. F. Jones, who states that the last movement of sea level was about 25 feet downward, leaving a well-marked strand line which is almost world-wide. In the Boston embayment this lowering of sea level was not sufficient to bring above the sea buried peat beds and fish weirs, which had apparently been submerged at some earlier date. In Campeche, Mexico, the 25-foot strand line is well marked, and in it are mounds and lime kilns, covered by marine sediments when the sea stood 25 feet higher. A pyramid at Jounta is wave cut at a point 25 feet above the present level of the sea, and according to the de Geer chronology, it must be over 3,500 years of age. It is probable that a rise of 25 feet in sea level would bring the Maya ruins of Pelengue practically to the coast, and it is estimated that this city existed over 4,500 years ago.

Professor Barton has found many examples around Boston of drumlins deeply eroded by subglacial streams.

One of the most interesting discoveries of its kind recently made is that of E. Thiessen, who has found that the rubber-like mass called "coorongite," found in South Australia, is the "peat stage" of boghead coals. The plant forming this rich oil-bearing substance is a colonial alga-like organism, named, "Elaeococcus," and not previously recognized by botanists. He presents undoubted evidence that the same type of organism exists in abundance in the fossil condition in the bogheads and some cannel coals.

SECTION F—ZOOLOGICAL SCIENCES

Vice-president and chairman, M. M. Metcalf.
Retiring vice-president, C. A. Kofoid.
Secretary, H. W. Rand, Harvard University, Cambridge, Mass.

(*Report by Herbert W. Rand*)

Section F (Zoology) arranged no independent program but met in conjunction wih its several associated societies. Unless otherwise stated, all sessions mentioned below were held in buildings of the Massachusetts Institute of Technology.

The biological smoker on Wednesday evening at the Walker Memorial, Massachusetts Institute of Technology, was attended by (roughly estimated) about five hundred persons. That same evening the Ecological Society of America held its annual dinner at the Athens Café, Boston.

The zoological exhibits, while not extensive in range, included matters of considerable interest. The most elaborate exhibit was that of the American Association of Economic Entomologists, illustrating field and experimental work on the gypsy moth and the European corn borer. An object of unusual general interest was a living specimen of the New Zealand Sphenodon (Hatteria) exhibited by Professor C. C. Nutting, of the State University of Iowa.

The section committee met at the close of the morning session of the Zoologists on Wednesday and proceeded to nominate as vice-president for the Section for 1923 Professor Edward L. Rice, of Ohio Wesleyan University. Also, Dr. Francis B. Sumner, of the Scripps Institution for Biological Research of the University of California, was nominated to succeed the retiring member of the section committee, Professor V. E. Shelford, of the University of Illinois. A business session of Section F was held Friday, December 29, at 9 a. m., with Vice-president Metcalf in the chair. The Section voted that Professor E. L. Rice be nominated to the council of the association as vice-president for 1923, and the nomination of Dr. F. B. Sumner for place on the section committee was confirmed by his election.

THE AMERICAN SOCIETY OF ZOOLOGISTS

President, H. H. Wilder.

Secretary, W. C. Allee, University of Chicago, Ill.

(*Report by Herbert W. Rand*)

Sessions of the American Society of Zoologists were held in the mornings and afternoons of Wednesday, Thursday and Friday, December 27 to 29. The session of Wednesday morning was held in three sections. Section I opened with a considerable list of papers on parasitology and then proceeded to papers on cytology and histology. Section II was arranged to provide for papers having special needs in the way of time or illustration. The main feature of this session was an extended account of the Fiji-New Zealand Expedition from the University of Iowa, presented by Professor C. C. Nutting, with lantern illustrations. Some papers on miscellaneous subjects were included in this session. Section III was held in conjunction with the Botanical Society of America (Joint Genetics Section), the program being devoted to papers dealing with genetics in animals. Further sessions of the Zoologists on Wednesday afternoon and Thursday morning and afternoon were occupied by papers on embryology, comparative anatomy, entomology and general physiology. On Thursday morning there was also a session of the Joint Genetics Section for papers on plant genetics followed by an afternoon session for animal genetics.

The sessions of the American Society of Zoologists were presided over alternately by the president, Professor H. H. Wilder, of Smith College, and by the vice-president of Section F, Professor M. M. Metcalf, of Oberlin College.

Friday morning was devoted to a joint session of the Zoologists and the Ecological Society of America. The program included fourteen titles on ecology and zoogeography and most of the papers were presented.

Friday afternoon the Zoologists met in joint session with the American Society of Naturalists and the Ecological Society of America for a symposium on *Geographical Distribution.* Nine groups were considered, as follows: Mammals, by Glover M. Allen, of the Boston Society of Natural History and the Museum of Comparative Zoology at Harvard University; Birds, by James P. Chapin, of the American Museum of Natural History; Reptiles, by Thomas Barbour, of the Museum of Comparative Zoology at Harvard University (in Dr. Barbour's absence his paper was read by E. R. Dunn); Amphibians, by E. R. Dunn of Smith College; Fishes, by C. H. Eigenmann of Indiana University; Mollusks, by H. A. Pilsbry, of the Philadelphia Academy of Sciences; Onychophora, by C. T. Brues, of the Bussey Institution of Harvard University; Insects, by P. P. Calvert, of the University of Pennsylvania; Echinoderms, by H. L. Clark, of the Museum of Comparative Zoology at Harvard University.

The annual zoologists' dinner took place on Thursday evening at the Parker House, Boston. About one hundred and forty were present. The place of honor was shared by Professor H. H. Wilder of Smith College, president of the American Society of Zoologists, and Pro-

fessor C. A. Kofoid of the University of California, retiring president of the Zoologists and retiring vice-president of Section F, American Association for the Advancement of Science. In the intervals between the serving of courses a male quartette sang some of Professor Wilder's well known biological songs. After the dinner Professor Kofoid gave his address as retiring president of the zoologists and retiring vice-president of Section F. His subject was "The life cycle of the protozoa." Starting from the conception of the cell as a dynamic entity rather than a thing necessarily limited by a visible cell boundary, he proceeded to a discussion of the Protozoa with a view to showing that the differences between the Protozoa and Metazoa have been over emphasized and that proper recognition of the fundamental similarities in life cycle and reproductive processes might well lead to the regarding of the protozoan as a "one-celled metazoan."

THE ENTOMOLOGICAL SOCIETY OF AMERICA

President, Arthur Gibson.

Secretary, C. L. Metcalf, University of Illinois, Urbana.

(Reports by C. L. Metcalf and Herbert W. Rand)

The seventeenth annual meeting of the Entomological Society of America was usually well attended, the attendance ranging from about seventy-five to two hundred and fifty in the different sessions. Sessions for a program of papers on miscellaneous subjects were held on Tuesday afternoon and Friday morning. A session on Wednesday afternoon was devoted to a symposium on "Adaptation of insects to special environments." The symposium program was divided into two sections. Part I consisted of ten-minute papers, each presenting the more noteworthy examples of adaptations to the particular environment discussed, the more striking features of the habitat and something of the course of evolution or development of the adaptation. Part II consisted of three-minute papers, each dealing with adaptation in a single species of insect or with a single unit of adaptation.

The annual public address of the society was given Wednesday evening by Professor W. M. Wheeler, dean of the Bussey Institution of Harvard University. His subject was "The physiognomy of insects."

The society held its dinner on Friday evening, with about one hundred and fifty present. Seventy-four new members were elected during the past year, bringing the total membership to 652, the largest in the history of the society.

The following officers were elected: *President,* Professor T. D. A. Cockerell, University of Colorado, Boulder, Colo.; *first vice-president,* Dr. Wm. S. Marshall, University of Wisconsin, Madison, Wis.; *second vice-president,* Dr. F. E. Lutz, American Museum of Natural History, New York City; *secretary-treasurer,* Dr. C. L. Metcalf, University of Illinois, Urbana, Ill.; *managing editor of the annals,* Professor Herbert Osborn, Ohio State University, Columbus, Ohio; *additional members of the executive committee,* Mr. Arthur Gibson, Dominion entomologist, Ottawa, Canada, Dr. W. A. Riley, University of Minnesota, St. Paul, Minn., Professor R. A. Cooley, Agricultural Experiment Station, Bozeman, Mont., Charles W. Johnson, Boston Society of Natural History, Boston, Mass., Dr. E. P. Felt, state entomologist, Albany, New York, Professor A. L. Melander, State College, Pullman, Wash.

The society voted to raise the annual dues from $2 to $3, effective January 1, 1924. Professor J. J. Davis, of Purdue University, was appointed treasurer of the Thomas Say Foundation, to succeed Dr. E. D. Ball, resigned. Messrs. R. A. Cooley, R. W. Harned and Guy C. Crampton were elected as new members of the editorial board of the *Annals.*

The society approved the constitution for the Union of American Biological Societies, as published in SCIENCE for September 29, 1922, and appointed Messrs. A. N. Caudell and A. G. Boving as the representatives of the society to attend such meetings as may be called during the coming year.

The following subject was selected for the symposium at the Cincinnati meeting in 1923: "Methods of protection and defence among insects."

THE AMERICAN ASSOCIATION OF ECONOMIC ENTOMOLOGISTS

President, J. G. Sanders.

Secretary, A. F. Burgess, Melrose Highlands, Mass.

(Report by A. F. Burgess)

The thirty-fifth annual meeting of the American Association of Economic Entomologists

was held in Massachusetts Institute of Technology, Cambridge, Mass., December 28 to 30, 1922. Professor James G. Sanders, chief, Bureau of Plant Industry, Harrisburg, Pa., presided throughout the meetings, and on Thursday morning delivered his presidential address entitled "Whither in entomology?"

The meeting was the largest ever held by this association, over one hundred and eighty members and a large number of visitors being present. All sections of the United States and Canada were represented, a number of members coming from the Pacific Coast.

Papers bearing on some of the large problems in controlling destructive introduced insects were presented and discussed, and a considerable part of the program was devoted to experimental work on insecticides for use in controlling insect pests of plant life. Important contributions relative to protecting such economic crops as cabbage, potatoes, tobacco, onions, peas, beans and other truck crops, as well as stored products, fruits, grain and green-house plants, from injury by insect pests, were given during the meeting.

The program of papers was large and varied, and ranged from the protection of golf greens from the larvæ of the Japanese beetle, and spraying from airplanes to the prevention of loss of domestic fowl from eating rose chafers and observations on horse flies in Louisiana.

The Section on Apiculture held its meeting on Thursday evening at the Boston Society of Natural History, where an extremely interesting program was presented. A number of local beekeepers and others interested in the subject attended this session, and many more would doubtless have been present had the weather been more favorable.

The Section on Horticultural Inspection was devoted to a number of papers and discussions on nursery and orchard inspection and quarantine work. The viewpoint of the nurserymen was presented by Mr. F. F. Rockwell, representing the American Association of Nurserymen. A general discussion of nursery stock fumigation also formed a part of the program. A statement concerning the gipsy-moth situation in New Jersey was also presented.

On Friday afternoon a symposium was held on the "Standards for training men who are to enter professional entomology." Addresses relating to this subject were presented by some of the foremost economic entomologists and best known teachers in this country. It was a session of particular interest to all the members and many visitors.

On Saturday morning a joint meeting was held with the American Phytopathological Society, at which the subject of plant quarantines was presented from different points of view and was generally discussed.

The widespread effect of these quarantines, as well as their value, is not fully appreciated by the general public. The protection they afford to the farmer is not well understood. The need for more precautions in preventing foreign pests from finding lodgment in this country was brought out very forcibly, and it was clearly shown that money expended for such protection was an extremely good investment.

The entomologists interested in the insect pest survey, which is designed to secure countrywide data on the abundance and destructiveness of insect pests year by year, and the entomologists engaged in extension work in the various states, held a very profitable meeting, which was devoted largely to a discussion of the problems at hand with a view to adopting better methods and securing more effective cooperation.

The group of the entomologists interested in insects affecting the health of man met with Section N of the American association and with other scientists who are working along related lines. This resulted in a very profitable conference.

An exhibit was prepared which filled one of the large rooms and illustrated the different methods used on the gipsy moth work and the corn borer work, together with charts and models showing the results of different lines of experimental work and the equipment and devices used in studying these insects as well as their parasites and natural enemies. Smaller exhibits of improved devices for laboratory use and excellent drawings of a number of insects and their work excited much favorable comment. The exhibit was a valuable addition to the meeting and was visited and examined in much detail by most of the members.

The Boston meeting was the largest one that has been held by this association and the papers were of more than ordinary interest. Seventy-six new members were elected and the associa-

tion was reported to be in good financial condition.

It was voted to take membership in the Union of Biological Societies.

The following officers were elected: *President,* A. G. Ruggles, St. Paul, Minn.; *first vice-president,* H. A. Gossard, Wooster, Ohio; *second vice-president,* H. J. Quayle, Riverside, Calif.; *third vice-president,* P. A. Glenn, Urbana, Ill.; *fourth vice-president,* S. A. Fracker, Madison, Wis.; *secretary,* A. F. Burgess, Melrose Highlands, Mass. Committees were also elected to carry on the specialized activities of the association for the current year.

THE AMERICAN NATURE-STUDY SOCIETY

President, William G. Vinal.

Secretary, Mrs. Anna B. Comstock, Ithaca, N. Y.

(Report by Herbert W. Rand)

The Americain Nature-Study Society held sessions on Thursday morning and afternoon and Friday morning and afternoon. These sessions were occupied by a general program. On Saturday morning the society met at the Museum of Comparative Zoology at Harvard University to listen to "Personal Reminiscences of Professor Louis Agassiz," by J. Henry Blake, and to visit the collections in the museum. On Saturday afternoon, in spite of highly unfavorable weather, members of the society visited the Arnold Arboretum of Harvard University, at Jamaica Plain, under the guidance of Professor John G. Jack.

The American Nature-Study Society held a dinner Thursday evening at the Hotel Bellevue, Boston, in honor of Mrs. Anna Botsford Comstock, who is retiring as professor of nature-study at Cornell University.

UNION OF AMERICAN BIOLOGICAL SOCIETIES

(Report by I. F. Lewis)

At the meeting of the association and affiliated societies in Boston the proposal to form the Union of American Biological Societies was acted upon by many of the societies. Data as to all the societies so acting are not yet at hand, but it is evident that the idea of cooperation is meeting rather general acceptance. The following societies, officially or unofficially, have decided to become members of the union: The American Physiological Society, the American Phytopathological Society, the American Society of Agronomy, the American Society for Horticular Science, the American Society of Naturalists, the American Society of Zoologists, the Botanical Society of America and the Entomological Society of America. The American Association for the Advancement of Science, and its four biological sections (F, G, N, O) voted to join the union, provided the special societies on the original list decide to do so. The action of other societies has not yet been reported and will be included in a later statement.

A meeting of the council consisting of two representatives from each society becoming a member will be arranged in the early spring in Washington.

At this meeting definite projects for carrying out the purposes of the union will be set under way. The expenses of the meeting will be met in part by an appropriation from the National Research Council, to whose invaluable assistance along with the sympathetic cooperation of the American Association for the Advancement of Science, the initial success of the union is so largely due.

SECTION H—ANTHROPOLOGY

Vice-president and chairman, T. Wingate Todd.

Retiring vice-president, A. E. Jenks.

Secretary, E. A. Hooton, Peabody Museum, Cambridge, Mass.

(Report of E. A. Hooton)

Section H (Anthropology) of the American Association for the Advancement of Science, the American Anthropological Association, the American Folk-Lore Society and the Maya Society held their annual meetings in Cambridge, December 27-29, 1922. Most of the sessions were held in the Massachusetts Institute of Technology and the remainder in the Peabody Museum of Harvard University.

The attendance upon the meetings was excellent and a total of fifty-five papers was presented before the various societies. The first day of the meeting was entirely devoted to contributions on physical anthropology read before Section H. Many of these dealt with new evidence upon the nature and extent of racial and individual variation in man. Dr. Alěs Hrdlička, of the U. S. National Museum, discussed the significance of recent finds of fossil man in the Old World; Adolph Schultz,

of the Carnegie Institution, offered new information upon fetal growth in man; C. B. Davenport, of the Station for Experimental Evolution, Cold Spring Harbor, N. Y., spoke on the heredity of build in man. An interesting feature of the session was the discussion of practical aspects of physical anthropology. Several important contributions to this subject were presented, among them two especially stimulating papers on the application of anthropology to clinical medicine, by Dr. George Draper and David Seegal of the Presbyterian Hospital, New York. The limitations of space preclude the mention here of some fifteen other meritorious papers, most of which will be published shortly.

Officers of Section H were nominated by the section, and were subsequently elected by the council of the American Association for the Advancement of Science, as follows: *Vice-president and chairman (1923)*, E. A. Hooton, Harvard University; *secretary (1923-1924)*, R. J. Terry, Washington University, St. Louis, Mo.; *member of section committee (1924-1926)*, R. B. Bean, University of Virginia.

THE AMERICAN ANTHROPOLOGICAL ASSOCIATION

President, W. C. Farabee.

Secretary, A. V. Kidder, Phillips Academy, Andover, Mass.

(Report by E. A. Hooton)

The American Anthropological Association had two very profitable sessions, consisting of some nineteen papers on ethnology, archeology, sociology and linguistics. Progress of European archeology was summarized by N. C. Nelson, of the American Museum of Natural History; new paleolithic finds in Siberia were described by George Grant MacCurdy, of Yale University; R. B. Dixon, of Harvard University, read a provocative paper on the racial history of the American Indian; and Chi Li, of Harvard University, aroused much interest by his discussion of anthropological problems of China.

The following officers of the American Anthropological Association were elected: *President*, Walter Hough, U. S. National Museum; *secretary*, A. V. Kidder, Phillips Academy, Andover.

THE AMERICAN FOLK-LORE SOCIETY

President, Frank G. Speck.

Secretary, Charles Peabody, Harvard University, Cambridge, Mass.

(Report by E. A. Hooton)

The American Folk-Lore Society held its annual meeting on the afternoon of December 28. Special features of the program were the demonstration of methods and apparatus of divination among the Bassa of Southern Cameroun, West Africa, by George Schwab, of the Peabody Museum, Harvard University, and a paper by J. Frank Dobie, of the University of Texas, on weather lore of the Texas-Mexican border. Officers were elected as follows: *President*, A. L. Espinosa, Leland Stanford University; *secretary*, Charles Peabody, Peabody Museum, Harvard University; *treasurer*, P. E. Goddard, American Museum of Natural History.

THE MAYA SOCIETY

(Report by E. A. Hooton)

The session of the Maya Society was held on the afternoon of December 29 in the Peabody Museum of Harvard University. In this connection the gold objects found in the sacred cenote of Chichen Itza, Yucatan, were exhibited by the Peabody Museum. Progress in the exploration of the ruined cities of Central America and new interpretations of cultural facts in that area were offered by S. G. Morley, of the Carnegie Institution; H. J. Spinden, of the Peabody Museum; A. M. Tozzer, of Harvard University; Marshall H. Saville, of the Museum of the American Indian, and William Gates, director of antiquities, of Guatemala. A controversial paper on the history of Maya and Aztec numerations was presented by Leo Wiener, of Harvard University. Officers of the society were elected as follows: *President*, William Gates, director of antiquities, Guatemala; *secretary*, Sylvanus G. Morley, Carnegie Institution, Washington, D. C.

SECTION I—PSYCHOLOGY

Vice-president and chairman, R. Dodge.

Retiring vice-president, E. A. Bott.

Secretary, F. N. Freeman, University of Chicago, Ill.

THE AMERICAN PSYCHOLOGICAL ASSOCIATION

President, Knight Dunlap.

Secretary, E. G. Boring, Emerson Hall, Cambridge, Mass.

(Report by F. N. Freeman)

The American Psychological Association held

its thirty-first annual meeting in conjunction with the meeting of the association, and the section for psychology (Section I) held no separate session. By a happy arrangement between the program committee of the Psychological Association and the section committee of Section I, place was made on the program of Thursday morning for a symposium organized by the section and on Thursday afternoon for the address of the retiring vice-president for the section, Dr. E. A. Bott. This arrangement seemed to be a very satisfactory one. The psychological meetings were held in Emerson Hall, Harvard University, while the other sections and societies met at the Massachusetts Institute of Technology, some distance away. For this reason, the symposium, which was planned to be of general interest, failed to attract any considerable number of outsiders. The accommodations in Emerson Hall were, however, very convenient. The proximity of the meeting of Section Q (Education) made cross visiting easy, and the setting of the dinner at the nearby Harvard Union on Thursday evening was delightful.

The increase in the number of psychologists makes the organization of a program more difficult each year. In some of the recent meetings there have been a bewildering number of parallel sessions. The program committee succeeded this year in reducing the periods at which parallel sessions were held to two. They did this by holding down the number of papers and classifying them into six groups, dealing with general, applied, experimental, clinical, comparative psychology, and mental measurement.

There is space for only general comments on the technical papers of the program. The prominence of applied psychology was one outstanding feature. Three sessions were devoted to general, experimental and comparative psychology, and five to applied and clinical psychology and mental measurements. The symposium was also devoted to applied psychology. That this proportion does not necessarily indicate the relative importance of the two parts of the field is obvious, but it indicates fairly the trend in practice. In spite of this trend, a certain amount of vigorous experimental work is going on, and several theoretical questions are arousing discussion.

The papers in the symposium were of general interest. Professor E. L. Thorndike made the point that much more is known in psychology than is applied and that it would be comparatively easy to lay down applications which would enormously benefit human life. He took illustrations from the facts of individual differences and dwelt at greater length on general facts of human nature, particularly instincts. For example, he argued that legal restrictions upon the expression of the instinct of mastery through gaining economic supremacy may cause it to find expression through more sinister forms of behavior. Dr. C. S. Yoakum discussed the applications of psychology to industry, particularly the analysis of the intellectual and temperamental qualifications of executives. He showed that there is no single type of successful executive and that the success of different types demands different working conditions. Dr. William Healy laid down a series of principles and facts regarding the bearing of psychology on the diagnosis and treatment of delinquency. He emphasized particularly the view that there is no clearly marked type of delinquent and that environment and habit may play a larger part in causation than intellectual ability or inherent traits. Dr. E. B. Mayo, recently of Australia, now at the University of Pennsylvania, discussed with illuminating illustrations the bearing of psychology on economic and industrial life. He dwelt particularly on the fact that unrest may be caused by pathological mental conditions which are subject to alleviation by appropriate treatment.

The address of the retiring vice-president, Dr. E. A. Bott, was concerned with a criticism of the presuppositions that underlie the scientific methods in research. He held that the assumptions which are sometimes dismissed as metaphysical are of importance and that views which frequently seem diverse are really at bottom the same. The address of the president of the association, Dr. Knight Dunlap, which was delivered at the annual dinner, was concerned with the foundations of social psychology. Dr. Dunlap criticized adversely the various current conceptions, particularly the view of instinct as elaborated by McDougall. In place of these views he suggested that the psychology of desire be studied as the foundation of social attitudes and behavior. He also suggested that the facts of social behavior might be experimenally studied in the theater and gave

illustrations of beginnings which have been made in such study.

The meetings of Section Q contained a number of items of interest to psychology particularly to the address of the retiring vice-president, Dr. G. M. Whipple, on "The present status of intelligence testing." At the business meeting of the association the annual dues were raised from $2.00 to $5.00 in order to provide more adequate funds for the carrying on of the affairs of the association and for the use of the secretary. The provision regarding the election of members of the Council was amended to provide that the Council should nominate six persons to be voted upon by later ballot. The committee on certification of clinical psychologists presented a report which recommended a reduction in the fee for such certification. This report was subjected to prolonged discussion and was referred to the committee again for later recommendation.

The following officers were elected: *President,* Dr. L. M. Terman, Stanford University; *Secretary,* Dr. John A. Anderson, Yale University; *Members of the Council,* Dr. Edwin G. Boring, of Harvard University, Dr. June E. Downey, of the University of Wyoming; *Members of the Section Committee of Section I,* Dr. R. M. Yerkes, Dr. Raymond Dodge. The association also nominated for appointment to the Division of Anthropology and Psychology of the National Research Council Dr. Raymond Dodge and Dr. R. S. Woodworth. Dr. L. M. Terman, who was elected president, is well known for his work with mental tests and for his study of gifted children.

The association voted to accept the invitation of the University of Wisconsin to meet in Madison in 1923. The dates of the meeting are December 27 to 29.

Since the next year's meeting of the Psychological Association falls within the general region of the meeting of the American Association for the Advancement of Science, which is to be held in Cincinnati, Section I voted to suspend its meeting for 1923. Dr. Raymond Dodge was renominated as vice-president for the succeeding year and was subsequently elected by the association council.

An account of the proceedings and programs in the botanical sciences, social and economic sciences, engineering, medical sciences, agriculture, education and scientific societies related to the American Association in general will be printed in subsequent issues of SCIENCE.

CHARLES D. WALCOTT

PRESIDENT OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE FOR THE YEAR 1923

A Biographical Note[1]

Dr. Charles Doolittle Walcott, secretary of the Smithsonian Institution since 1907 and president-elect of the American Association for the Advancement of Science, is descended from early New England settlers. He was born March 31, 1850, at New York Mills, Oneida County, New York, and attended the public schools of Utica and the Utica Academy, which he left in 1868. In early youth he became interested in fossils and minerals and in natural history generally, and at the age of seventeen he had already planned to make a systematic study of the older fossiliferous rocks of North America. From two years' experience in a hardware store he gained much practical business training, but his scientific interests drew him away from commercial enterprises and he returned to farm life and his chosen studies. He arranged to do some farm work in return for board and lodging, on a farm near Trenton Falls, New York, reserving the rest of his time for study and collecting. The years from 1871 to 1876 were spent in this way. In 1873 he sold a fine collection of Trenton limestone fossils to the Museum of Comparative Zoology of Harvard College. He planned to pursue a course of study with Louis Agassiz, but the great naturalist died before this plan could be carried out.

Dr. Walcott's first official appointment came to him in November, 1876, when he became assistant to James Hall, then state geologist of New York. In that position he carried out researches in New York, Ohio, Indiana and Canada. It was in 1876 that he became a member of the American Association for the Advancement of Science, in which he has continued his membership to the present time. He was elected to fellowship in the association in 1882.

[1] Based on an article that appeared in the *Geological Magazine,* decade vi, Vol. vi, No. 655, pp. 1-10, January, 1919.

In July, 1879, Dr. Walcott became a field assistant in the United States Geological Survey. He studied the high plateaus of southern Utah and the Grand Canyon and afterwards took part in a thorough investigation of the Paleozoic deposits of central Nevada. He was placed in charge of the Paleozoic paleontology of the Geological Survey, but still found time to continue his studies of the older faunas. He examined the Appalachian Cambrian formations from Alabama to Quebec and Newfoundland. He also took up a series of western studies that eventually covered the main Cambrian and pre-Cambrian bodies in the great region from California and Texas to Montana and South Dakota. In 1888 he became paleontologist in charge of invertebrate paleontology, in 1891 he became chief paleontologist, and in 1893 he was advanced to be geologist in charge of geology and paleontology in the survey. In July, 1894, Dr. Walcott was appointed to succeed Major J. W. Powell as director of the United States Geological Survey. He held this position until 1907, when he resigned to become secretary of the Smithsonian Institution, of which he had already been assistant secretary in charge of the National Museum.

His work in the Geological Survey resulted in the reorganization of the survey on scientific and business principles. The Congress and those with whom he came in contact placed continually increasing confidence in his ability and reliability. The United States Reclamation Service was organized under Dr. Walcott's direction between 1902 and 1907. He encouraged public interest in national forestry and secured in 1898 the first comprehensive law organizing the national forest reserves.

From 1902 to 1905 Dr. Walcott was the administrative officer of the newly founded Carnegie Institution of Washington, and he took a large part in the successful organization of that institution. He has been a member of its executive committee since 1902. He was elected to the National Academy of Sciences in 1896 and has been its president since 1917.

During his long and successful term as secretary of the Smithsonian Institution, Dr. Walcott has directed researches in many parts of the world and he has given much personal attention to productive studies of the Canadian Rocky Mountains in British Columbia and Alberta, on which studies he is still engaged. He is well known as a scientist throughout the world, especially as a persistent and successful student of the Cambrian and Algonkian sediments and their included organic remains. Of his studies he says[2] that they "have involved new and somewhat startling discoveries that helped to show how very much earlier life was developed on our planet than we had previously supposed." Furthermore, "these researches have taken into consideration the records left on all the continents and many of the great islands * * * in the hope of finding evidence of the presence of minute and active bacterial and simple algal workers, such as exist in modern seas and lakes."

Dr. Walcott has taken active part in the work of many organizations and committees, connected with the government and otherwise, and he was specially active in many lines of war work. He is a member of many learned societies, both of this and of other countries. He has been the recipient of honorary degrees from the following universities: Hamilton, 1897; Chicago, 1901; Johns Hopkins, 1902; Pennsylvania, 1903; Cambridge (England), 1909; Yale, 1910; St. Andrews (Scotland), 1911; Christiania, 1911; Pittsburgh, 1912; Harvard, 1913. He has been awarded the Hayden Medal (Academy of Natural Sciences of Philadelphia), the Bigsby and Wollaston Medals (Geological Society of London), the Gaudry Medal (Société Geologigue de France). From 1875 onward there have been very few years that are not marked in Dr. Walcott's list of scientific publications, and most of the years of this long period each saw the publication of two or more papers from his hand. In electing Dr. Walcott to be its president for 1923, the American Association for the Advancement of Science has added a worthy name to its long and honorable roll of presidents.

THE ORGANIZATION, WORK AND PURPOSES OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

GENERAL SCOPE

The American Association for the Advancement of Science aims to advance science in the

[2] Walcott, Charles D.: "Evidences of primitive Life," *Smithsonian Report* for 1915 (Publ. 2389) pp. 235-236, 1916.

New World in every feasible way. It is broadly international in its scope. The majority of its members and all the societies now associated with it are of the United States or Canada, but its field is not limited to those two countries and it has members residing in all parts of the world. All who are interested in the progress of knowledge and education are eligible to membership. During the past seventy-four years the association has played an increasingly important rôle in American scientific and educational improvement. Its organization presents two aspects:

(1) . It constitutes a cooperation of many thousands of individuals for the advancement of science and all that this phrase implies. At the close of the fiscal year 1922 (September 30, 1922) there were 10,566 members in good standing, and the membership list included 11,646 names. Its membership represents persons engaged in scientific or educational work or appreciating the value of these lines of activity. The individual members of the association support its projects through financial contributions, which may have the form of *sustaining-membership* contributions, *life-membership* contributions, *annual membership* dues, or *associateship* dues. Contributions of the last two forms are used directly to support the work of the association, while only the income from the first two forms of contribution is thus used, these contributions themselves being permanently invested and very carefully guarded.

(2) The association is also a great general organization of eighty-three wholly autonomous and independent *associated* scientific societies and thirteen local academies of science and learning. Forty-three of the larger associated societies and all of the associated academies are officially *affiliated* with the association. Affiliated societies have representation in the association council and in its section committees, thereby taking part in the control of its affairs. Whether affiliated or not, the associated societies have no responsibility for the financial support of the greater organization, which is borne, as has been said above, solely by the individual members. A list of the associated societies is presented farther on in this issue of SCIENCE.

The association aims to assist, in every feasible way, the work of all men and women of science and that of all scientific and educational organizations, especially those that are associated with it. A large number of the latter regularly meet at the times and places of the association meetings, while many others frequently do so. The facilities of the association, for arranging sessions, etc., are at the disposal of all the societies that meet with it at any of its meetings. Reduced railway rates for the meetings are generally secured. To individual members the organization is valuable in many ways, especially through its publications and through the meetings. The permanent secretary's office is always ready to aid the scientific work of members in every way possible. It is hoped that all members and all associated societies may realize that the American Association for the Advancement of Science is *their* association, and that they will continue to demand of its officers more and better work for the growth of knowledge, for increased popular appreciation of science and the scientific method of thought, and for the improvement of democratic civilization in general. It is also hoped that both the societies and the individual members will enter fully into the spirit of cooperation with the section secretaries, with the permanent secretary's office, and with the other offices and committees of the association, to the end that the services of the association may be still further broadened, its prestige may be still further enhanced, and its power may be still further strengthened, "to give a stronger and more general impulse and more systematic direction to scientific research, and to procure for the labors of scientific men increased facilities and a wider usefulness."

ORGANIZATION

The direction of the association rests in the council, a democratically constituted body that combines the legislative and executive functions. The council consists of the president, the vice-presidents (at present 15 in number), the treasurer, the general secretary, the permanent secretary, the secretaries of the sections (now 15 in number), the council representatives of the affiliated societies and academies (43 societies and 13 academies, with 87 representatives altogether) and eight other members. All council members, excepting the representatives of societies and academies, are elected by the council itself, for it nominates and elects the president, the general and permanent secretaries, the treasurer and the eight additional elected mem-

bers, and it elects the vice-presidents and section secretaries on nominations by the respective sections. There are 129 council memberships at present, but the same person sometimes serves in more than a single capacity, and there are now 126 names on the council roll. A list of the council members for 1922 has been presented on earlier pages of this issue of SCIENCE. The council meets regularly four or five times during each annual meeting, and interim business is transacted by the executive committee of the council, which consists of the president, the general secretary, the permanent secretary and eight other members elected by the council. The executive committee for 1922 consisted of Simon Flexner, *chairman;* J. P. McMurrich, *president*; D. T. MacDougal, *general secretary*; B. E. Livingston, *permanent secretary*; J. McK. Cattell, H. L. Fairchild, L. O. Howard, W. J. Humphreys, A. A. Noyes, Herbert Osborn and H. B. Ward. For 1923 the personnel remains the same, with the exception that Dr. McMurrich is succeeded by Dr. Walcott, the president-elect.

The association has fifteen sections, representing the main current subdivisions of science, and each is designated by a letter, as follows: A (Mathematics), B (Physics), C (Chemistry), D (Astronomy), E (Geology and Geography), F (Zoological Sciences), G (Botanical Sciences), H (Anthropology), I (Psychology), K (Social and Economic Sciences), L (Historical and Philological Sciences), M (Engineering), N (Medical Sciences), O (Agriculture), Q (Education). Members of the association may be enrolled in one or more sections and a card file of its members is maintained for each section. Section P is planned for Manufactures and Commerce, but has not yet been organized.

ACTIVITIES

The activities of the association are, in general, of three kinds, those related to the holding of the annual and other meetings, those related to publications and those related to the advance of knowledge by research. These may be briefly considered in order.

MEETINGS

The regular annual meetings, now held in the winter, during convocation week, are made possible by the organization of the association. A local committee for each meeting is organized, which has charge of all local details. These meetings are the only large gatherings of the kind that include all branches of science. They present to the people an orderly exposition of all the branches of American scientific thought. These, and the other meetings that are occasionally held, constitute a powerful means of disseminating knowledge, of cultivating the scientific attitude of mind and of promoting a general appreciation of the great importance of science and scientific study. For each meeting the association organizes a publicity service, which gives to the daily press authoritative accounts regarding science. The meetings also furnish the only means by which such a large number of active workers in all branches of science are brought together from distant regions, with consequent opportunities for the formation and renewal of numerous personal acquaintanceships and friendships.

When an associated society meets with the others of the group all of its needs are cared for through the organization of the association. In these cases the society officers are freed from most of the preliminary work that must always be done in preparing for a society meeting. The association does not urge that associated special scientific societies should always meet with the larger group representing all the sciences; there are good reasons why some societies should generally meet at other times and places, and why some should frequently or occasionally do so. This matter is of course decided by each society for itself. But the association does *invite* all scientific societies to meet with it, especially at the greater four-yearly meetings, and it proffers the machinery of its organization for the advantage of all societies that accept this invitation. It asks the officers of societies that meet elsewhere and at other times to consider seriously how they may be able, nevertheless, to aid their respective section committees to present their respective fields of science in an adequate and impressive way, and the council representatives of the societies to take active part in the work of the association. In a great exposition of American scientific work such as one of the annual meeting of the association, as well as in the conduct of its affairs in general, it is surely desirable that the work of every special scientific society should be well represented. In the absence of the associated societies a section committee arranges the program for its field of scientific

work; in the presence of the societies the program is mainly left in their hands.

The council aims to select meeting places in such a way as to bring the meetings successively into the various regions of the United States and Canada, in order that all members may frequently attend without too extensive journeys, and that the wholesome local publicity for scientific work and the general educational influences that always result from the meetings may be brought to all quarters of the two countries.

PUBLICATIONS

The weekly journal SCIENCE, official organ of the association, furnishes an open forum for the discussion of questions regarding science and education. Almost every branch of scientific knowledge is represented in its columns. Many shorter scientific contributions of the results of research are published in SCIENCE, which probably has a larger circulation than any other journal that embraces the entire scientific field.

Since SCIENCE became the official organ of the association for the publication of its official anouncements and the reports of its meetings, the annual publication of a volume of proceedings has been discontinued, and volumes of summarized proceedings have been published in their stead. Two volumes of this kind have appeared—one in 1915, covering four years, and one in 1921, covering six years. Each of these volumes presents the lists of officers, etc., for each of the years in question, together with references to SCIENCE for the presidential and vice-presidential addresses and other official communications for these years. It also includes the complete membership list as this stood at the date of printing.

The membership list of the association forms one of the most valuable instruments of its kind as an address list of American scientific workers and friends of science. The 1921 list contains about 12,000 names and addresses, and furnishes a valuable reference volume at a very low cost. Fellows of the association as well as life and sustaining members are specially designated. The publication of the membership list is a valuable and important service performed by the association in the interest of intercourse and cooperation among men of science in America.

From time to time the council of the association has adopted resolutions calling attention to various matters that pertain to the general welfare, as this is related to scientific thought and setting forth the position taken by the association in these matters. Such resolutions are published in SCIENCE and are sent to interested persons and organizations.

One of the most important features of the work of the association is the support it gives toward the publication of SCIENCE, and one of its main objects is the publication and wide circulation of this weekly journal. SCIENCE is sent free to all members in good standing. Such members are allowed, however, to receive *The Scientific Monthly* instead of SCIENCE, if they so request. At the beginning of the calendar year a subscription to the journal for that year is ordered from the publishers for each member whose annual dues for the current fiscal year have been paid. As a special accommodation, members who paid dues for the preceding fiscal year are kept on the mailing list of the journal until February 1. The journal is discontinued on the last-named date unless the current dues have been paid. Those paying their dues still later in the year receive the journal from the time the dues are paid, but, as a special favor, may receive the back issues for the current calendar year *if they so request, provided they pay for the transportation of these back issues at the rate of one cent for each copy.*

The summarized proceedings are sold to those whose names appear on the membership list at a price that covers about half of the actual cost of paper and printing. Nonmembers may purchase the volume at a somewhat higher price. Copies of the 1921 volume may be purchased by members from the permanent secretary for $2.00, by others for $2.50. It is planned to publish the next volume in the fall of 1925.

The association publishes a preliminary announcement for each meeting, which is mailed to all members. It also publishes a general program for each meeting. Each general program of an annual meeting forms an excellent epitome of the status of American science.

ENDOWMENT AND GRANTS FOR RESEARCH

The American association is entrusted with a considerable permanent endowment, which

has been derived from gifts and bequests of public-spirited persons and from payments made by sustaining members and life members. The income derived from these funds is employed to advance scientific research. It is annually appropriated for grants, which are made to individuals or scientific organizations, to aid research projects. Applications for financial assistance in scientific investigations are referred to a special committee on grants, which considers the applications and apportions the available funds. For the year 1922 this committee thus apportioned the sum of $4,000 in twenty-one different grants. Recipients of these aids to research make reports to the association, showing how the funds have been expended and the nature of the results obtained.

It is desirable that the endowment of the association be increased whenever possible, and it is hoped that the opportunity thus offered for continuously aiding the increase of useful knowledge may be widely appreciated. All who are interested in the advancement of science by research are urged to bring the existence of this trust fund to the attention of public-spirited and philanthropic men who might become donors, sustaining members or life members of the association. The fundamentally democratic nature of the American association and its broad, general scope constitute an unusual guarantee that funds entrusted to it will be reasonably and efficiently employed in ways calculated to advance science and improve education.

The association offers the most efficient means by which individuals, scientific societies and scientific institutions may unite to hasten the growth of scientific knowledge and to increase public appreciation of what the peoples and nations owe to science and what may be expected of science in the future. The insistent urge of many individuals and organizations, united in such a comprehensive association for the advancement of learning, is capable of exerting a most powerful influence for good in national and international development.

COOPERATION WITH OTHER ORGANIZATIONS

Besides the activities mentioned above, the American association cooperates with other organizations for the advancement of learning. Most of the American scientific societies for special fields of science are affiliated or otherwise associated with the association.

A scientific society may become associated with the American Association on making application to the permanent secretary and upon a vote of the council. No special obligations are involved; but when associated societies meet with the association, the local committee attends to their arrangements, their official programs are published in the general program and their members receive the privilege of reduced railway rates whenever these are secured for the meeting. Their names are shown in the official list of associated societies. Scientific societies are encouraged to become associated with the association.

An associated society may become affiliated with the association upon application to the permanent secretary and upon a vote of the council. Affiliated societies are generally societies for the promotion of scientific research, and they have representation in the council of the association and in its section committees, their representatives being chosen from among the fellows of the association. Members of affiliated societies have the privilege of becoming members of the American association without payment of the usual entrance fee, if they make application before the second October 1 following their entrance into the society. When a society first becomes affiliated this special privilege is offered to all of its members, the offer being open until the second October 1 following the ratification of the arrangements of affiliation. Each affiliated society elects one member of the council of the association, and those societies of which one hundred or more members are fellows of the association elect two council representatives.

Two regional divisions of the association are in very successful operation—the Pacific Division and the Southwestern Division. The former includes all association members residing in Alaska, British Columbia, Washington, Oregon, California, Idaho, Nevada, Utah, Mexico (excepting Sonora and Chihuahua), the Hawaiian and Philippine Islands and other islands of the Pacific. The Southwestern Division includes association members resident in Arizona, New Mexico, Colorado, Sonora, Chihuahua and Texas, west of the Pecos River. These divisions are autonomous, holding annual and other meetings and engaging in projects for the advancement of science in their respective regions. Their individual members are members of the association and have all the

rights and privileges of this membership. Excepting newly elected members, members of a division pay their annual dues to the Washington office, and the division receives one dollar for each payment thus collected. New members of a division pay the entrance fee and the first annual dues to the division. The division retains the entrance fee and sends five dollars (the first annual dues) to the permanent secretary's office in Washington; upon the receipt of this the new member is enrolled and the journal is ordered for him, and one dollar is transmitted to the division secretary.

Local branches of the association are authorized; and one such branch has thus far been formed, the State College (Pennsylvania) Branch. This branch has two kinds of members—national (regular members of the association residing in or near State College) and associate (individuals who take part in the work of the branch but who are not members of the association). The affairs of the branch are mainly directed by its national members; it is autonomous in its local work. The branch receives, for its expenses and to promote its activities, the entrance fees (five dollars each) paid by its new national members and fifty cents for each payment of annual dues made by its national members.

State academies of science, excepting those representing states lying within the region of either of the two divisions, may become affiliated with the association, there now being thirteen affiliated academies (including the Southern Education Society in this group). This form of affiliation has been planned to promote the growth of the several academies and especially to aid them in making their meetings increasingly successful and locally influential. Affiliated academies receive the entrance fees collected from new association members who are on their membership lists. They also receive one dollar from each payment of annual dues made to the association by their members.

The association co-operates in other ways with its regional divisions and with its affiliated academies to aid in their work of encouraging local interest and appreciation regarding scientific progress.

Many projects for the advancement of science, for the improvement of education and for increased national and international welfare have received the support of the association. Its Committee of One Hundred on Scientific Research, organized early in 1914, formed the beginning of a nation-wide endeavor to accelerate systematic research and to render the knowledge of individuals more readily available to other individuals and to their government and nation. The National Research Council, of the National Academy of Sciences, is now the most prominent national organization for this work in the United States, and the association cooperates wih the Research Council in many ways toward the advancement of science and the encouragement of scientific research.

The association has been appreciative of the need for improved facilities for bringing published scientific work to the attention of those who would make use of it, such facilities as abstract journals and other similar aids to research. Financial grants were made to aid the *Concilium Bibliographicum* in its earlier years, and *Botanical Abstracts* was similarly helped at a time when such support was greatly appreciated. Both of these enterprises are now in very promising condition, through assistance secured for them by the National Research Council.

The association cooperates with the U. S. National Academy of Sciences and the U. S. National Research Council in the recently founded Science Service whose aim is to disseminate truthful and at the same time readable information about scientific subjects.

It is the aim of the association: To extend its activities in all lines just as rapidly as possible; to make its meetings more efficient and more beneficial; to enlarge the journal and give it a still wider circulation throughout the world, and a farther-reaching influence upon thoughtful people; to become the trustee of increased endowment for scientific research, thereby being able to aid directly in new discoveries and new applications of knowledge.

Scientific Societies Associated with the American Association for the Advancement of Science

(Arranged according to the corresponding sections of the association.)

(Affiliated societies are designated by asterisks; a single asterisk denotes one representative in the association council and two asterisks denote two representatives.)

A. MATHEMATICS

**The American Mathematical Society.
**The Mathematical Association of America.

B. PHYSICS

**The American Physical Society.
*The Optical Society of America.
*The American Meteorological Society.

C. CHEMISTRY

**The American Chemical Society.
The American Institute of Chemical Engineers.
The American Electrochemical Society.

D. ASTRONOMY

**The American Astronomical Society.

E. GEOLOGY AND GEOGRAPHY

**The Geological Society of America.
**The Seismological Society of America.
The Paleontological Society of America.
**The Association of American Geographers.
**The American Geographical Society.
The National Council of Geography Teachers.
The American Alpine Club.
The Mineralogical Society of America.

F. ZOOLOGICAL SCIENCES

**The American Society of Zoologists.
**The Entomological Society of America.
**The American Association of Economic Entomologists.
*The Eugenics Research Association.
*American Society of Mammalogists.
The Wilson Ornithological Club.

G. BOTANY

**The Botanical Society of America.
**The American Phytopathological Society.
The Botanists of the Central States.
The American Fern Society.
The Sullivant Moss Society.

F, G. ZOOLOGY AND BOTANY

**The American Society of Naturalists.
**The Ecological Society of America.
**The American Genetic Association.
**The American Microscopical Society.
The American Nature-Study Society.

H. ANTHROPOLOGY

**The American Anthropological Association.
The Archeological Institute of America.
The American Folk-Lore Society.

I. PSYCHOLOGY

**The American Psychological Association.
The Southern Society for Philosophy and Psychology.

K. SOCIAL AND ECONOMIC SCIENCES

The American Civic Association.
The American Economic Association.
The American Association for Labor Legislation.
The American Metric Association.
The American Sociological Society.
The American Statistical Association.

M. ENGINEERING

**The American Society of Mechanical Engineers.
**The American Institute of Electrical Engineers.
**The American Institute of Mining and Metallurgical Engineers.
**The American Society of Civil Engineers.
**The Illuminating Engineering Society.
*The American Society for Testing Materials.
The American Society of Heating and Ventilating Engineers.
The American Society of Refrigerating Engineers.
The Society for Promotion of Engineering Education.
The American Ceramic Society.

N. MEDICAL SCIENCES

**The American Medical Association.
*The American Association of Anatomists.
The American Physical Society.
*The Society of American Bacteriologists.
The American Society for Pharmacology and Experimental Therapeutics.
The American Society of Biological Chemists.
The American Society for Experimental Pathology.
The American Public Health Association.
The Society of American Microanalysts.

O. AGRICULTURE

*The American Society of Agronomy.
*The Society of American Foresters.
*The American Society for Horticultural Science.
The American Pomological Society.
The Society for Promotion of Agricultural Science.
The Association of Official Seed Analysts.
The American Society of Animal Production.
*The Canadian Society of Technical Agriculturists.
The American Dairy Science Association.

Q. EDUCATION

**The National Society of College Teachers of Education.
**The American Federation of Teachers of the Mathematical and Natural Sciences.
**The National Society for the Study of Education.
The American Philosophical Association.
*The American Association of University Professors.

SOCIETIES NOT SPECIALLY RELATED TO ANY PARTICULAR SECTION

**The Society of Sigma Xi.
*The Association of University Professors.
**The Gamma Alpha Graduate Scientific Fraternity.
The Bibliographical Society of America.
The Gamma Sigma Delta Society.
The Phi Kappa Phi Fraternity.
The Phi Delta Kappa Fraternity.

AFFILIATED ACADEMIES OF SCIENCE, ETC.

*The Illinois State Academy of Science.
*The Iowa Academy of Science.
*The Kansas Academy of Science.
*The Kentucky Academy of Science.
*The Maryland Academy of Sciences.
*The Michigan Academy of Science.
*The Nebraska Academy of Science.
*The New Orleans Academy of Sciences.
*The North Carolina Academy of Science.
*The Ohio Academy of Science.
*The Oklahoma Academy of Science.
*The Wisconsin Academy of Sciences, Arts and Letters.
*The Southern Education Society.

MEMBERSHIP IN THE AMERICAN ASSOCIATION

Any person interested in the progress of science and education in any way may become a member of the association, and all are in-

vited to do so. An application and information card is filled in and returned to the permanent secretary, with a remittance covering the amount of the entrance fee ($5) and the amount of the annual dues for the first year ($5).[1] On receipt of this payment by the permanent secretary the journal is ordered. A certificate of membership is sent to each new member as soon as he has been elected.

Any member of an affiliated society may become a member of the association, with all the privileges of membership, on payment of annual dues for the first year ($5), the entrance fee being omitted in such cases, *providing application is made before the second October 1 following the member's election to the affiliated society.* Such application should be made on a special (blue) application card provided for this purpose. This privilege is open also to all members of the three societies mentioned below under "Special Notices."

In making application for membership the blanks on the application card should be carefully filled in, to the end that the permanent secretary's files and the published membership lists prepared therefrom may be correct. Cards may be obtained from the permanent secretary's office at any time.

Life members each pay $100 in one year (having paid the entrance fee or having had it omitted through joining an affiliated society) and are exempt from all further dues.

Sustaining members each pay $1,000 and are exempt from all further dues.

Members who are engaged in scientific work or who have advanced science by research may be elected to fellowship in the association.[2]

[1] Persons residing in the region of the Pacific Division or of the Southwestern Division send their applications and remittances for the first year to the division secretary instead of the permanent secretary. For later years they pay their dues to the permanent secretary. New members of the State College Branch pay entrance fees and annual dues for the first year to the branch secretary. For later years their dues are paid to the permanent secretary's office. Members of affiliated societies and academies send applications and all remittances to the permanent secretary.

[2] See the article on Fellowship Elections, elsewhere in this issue of SCIENCE.

SPECIAL NOTICES TO MEMBERS AND PROSPECTIVE MEMBERS OF THE A. A. A. S.

1. The present issue of SCIENCE is sent to all persons whose names are on the roll of the association, whether they regularly receive this journal or the *Scientific Monthly.* For those who have not yet paid their annual dues for 1923, this is the last issue to be sent until after the payment shall have been made. Annual dues were due last October 1. The journal has been continued through January to those few who are still in arrears with the hope that they would find it convenient to pay before the end of the month. It was also thought that those who are still in arrears would appreciate receiving this special issue with its account of the recent Boston meeting.

2. The American association is now nearly seventy-five years old, having been founded in September, 1848. At the next annual meeting to be held in Cincinnati, December 27, 1923, to January 3, 1924, will be celebrated the seventy-fifth anniversary. Special features are being planned.

3. The association will hold a summer meeting in September, 1923, at the University of Southern California, Los Angeles, in conjunction with the Pacific Division and the Southwestern Division.

4. The meeting of December, 1924, is to be held in Washington, D. C., and that of December, 1925, is to be held in Kansas City.

5. All members of the Canadian Society of Technical Agriculturists and all members of the American Association of University Professors are this year invited to join the American Association for the Advancement of Science without payment of the usual entrance fee, because these organizations have recently become officially affiliated with the American Association for the Advancement of Science. By special action, this privilege is open also to all members of the Society of Sigma Xi and to all members of the American Medical Association. Recently elected members of any affiliated society are similarly privileged. To take advantage of this use a blue membership application card and accompany it only by the annual dues for the first year.

BURTON E. LIVINGSTON,
Permanent Secretary